

INTRODUCTION

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Middle Andaman, Baratang and South Andaman. It is a long narrow stretch of land with a much indented coast, surrounded by many smaller islands, of which the most important are Interview Island off the west coast, Ritchie's Archipelago on the east, Rutland Island at the extreme south, and the outlying North Sentinel Island. The length of the Great Andaman with Rutland Island is nearly 160 miles, while the breadth from sea to sea is nowhere more than 20 miles. The Little Andaman lies to the south of the Great Andaman, about 30 miles distant from Rutland Island, from which it is separated by a shallow strait with a maximum depth of only 21 fathoms. The island is about 26 miles long from north to south and about 16 miles wide. 131 133

Viewed from the sea the islands appear as a series of hills, nowhere of any great height, covered from sky-line to high-water mark with dense and lofty forest. The hill-ranges run approximately north and south, in the same direction as the islands themselves, and attain a greater elevation on the east than on the west. The highest point of the North Andaman is Saddle Peak (2402 feet), that of Middle Andaman is Mt Diavolo (1678 feet), while the South Andaman has the Mt Harriett Range (1505 feet), and in Rutland Island there is Mt Foord (1422 feet). There are no streams of any size. The water drains from the hills into tidal creeks running through mangrove swamps, often many miles in length. The coast is broken by a number of magnificent harbours. The shores are fringed with extensive coral reefs, and on these and in the creeks there is abundance of fish and molluscs. 133

The islands, save for the clearings of the Penal Settlement, are covered with dense tropical forest. There are few mammals, the only two of any size being a species of pig (*Sus andamanensis*, Blyth) and a civet-cat (*Paradoxurus tyleri*, Tytler). The other mammals are a few species of rats, a tree-shrew and some species of bats. Of birds there are many different species, some of them peculiar to the islands. The reptiles include a considerable number of species of snakes, and a few species of lizards, of which the most noteworthy is the large Monitor lizard (*Varanus salvator*). 136 •

such, not because they find any difficulty in procuring other food.¹ 262

3. Both *dryô to-* and *êrem-tâ-ga-* find ample² provisions for their simple wants in their immediate surroundings, without exerting themselves to any great extent, and their eagerness in the chase is induced almost as much by actual love of sport as by the necessity of obtaining food: were this not the case they would hardly be found spending so much time in dancing and singing, in personal decorations, and in the preparation of their meals, while they reject with aversion anything that has become at all tainted. Further, it may be fairly estimated that one-third of the food daily consumed by them consists of edible roots, fruits, and honey, and the remaining portion of the flesh of one or more of the following, viz.: pig, *paradoxurus*,³ iguana, turtle, fish, and molluscs, with rare additions of pigeons and jungle fowls;⁴ Flying-foxes, bats, rats, and (not land-) snakes, the larvæ of the Great Capricornis beetle (*Cerambyx heros*) called *ô-yum-*,⁵ as well as two other insects, called *bû-tu-* and *pî-rî-gî-*,⁶ are, it is true, also eaten, but they are partaken of by way of variety, and the latter are regarded as luxuries (*â-kâ-râ-rnga-*, tid-bits) to supplement (not substitute) other fare.⁷ 224 136 262 222

4. The Andamanese are nominally content with two meals a day, viz.: breakfast (*â-kâ-nâ-*) and a heavy supper (*â-kan-go-lajnga-*) after sun-down; they will, however, often help themselves to small quantities of food from time to time in the course of the day when engaged on any work; and, when leaving on a 264

¹ "It cannot be wondered at that these savages love the unfettered life of their own wild jungles, where their simple wants are easily supplied—a lean-to serving them for quarters, and food such as they are accustomed to being found in great abundance. Nothing comes amiss to an Andamanese maw; roots, wild fruits, berries, crabs, clams, fish, wild pigs, and turtle are all ravenously devoured, and a glance at the well-nourished bodies of men, women, and children amply convinces one that they do not starve" (vide "Bombay Gazette," 2nd August, 1881: "The Andamans, our Indian Penal Settlement;") vide also paper by Professor Owen, F.R.S., "On the Psychological and Physical Characteristics of the Minicopies," Report of British Association, 1861, p. 246.)

² Vide "Tribal Communities," paragraph 2, and Appendix F (Wô-i's statement).

³ It is presumed that Dr. Day refers to this animal when he states that "they eat cats," for they do not appear ever to have had any fancy for the flesh of *pû-chî*, the name they have adopted for the domestic cat, from the English "puss."

⁴ Vide "Tabu," paragraph 2 (footnote).

⁵ Probably the "fat grub, about three or four inches long, much relished by the natives" (Australians), mentioned by Mr. H. W. Bates, in his "Illustrated Travels," is identical with the *ô-yum-*.

⁶ The *bû-tu-* is found in rotten logs of jungle trees, especially the *Dipterocarpus laevis* (*â-rain-*), *Gluta longipetiolata* (*jâ-*), and *Chickrassia tabularis* (*ô-ro-*).

⁷ Their fancy for grubs does not extend to the *Teredo navalis*.

heads or jump overboard, and even at times try to alleviate 271
their sufferings by swallowing salt water.¹

8. In opening certain shell-fish² the adze is not employed, but one of the valves of the *Cyrena* is dexterously inserted between the lips, which are thus forced apart, after which the fish is killed with a knife or bladed arrow, and boiled; the *Tridacna crocea* and *Tridacna squamosa* are opened by inserting a piece of wood as a wedge between the valves,³ afterwards the fish is despatched by stabbing it with an arrow point or blade; the various *Arca* species and the *Mytilus smaragdinus* are, however, not so treated, but are placed among a heap of burning logs for a few moments, the object being merely to part the valves, which would otherwise be a matter of some difficulty: when this is accomplished the shells are removed by means of the bamboo tongs (*kai*-⁴), and their half-cooked contents are transferred to a pot⁵ (*būj*-) in which a little water has been placed; after being boiled a short time the gravy and flesh are eaten with the help of the shells. [In former times oysters were eaten cooked,⁶ but now their consumption appears to be confined to the inhabitants of North (and possibly also Little) Andaman: they give no reason for this change, but it may be due to their having occasionally suffered by feasting unconsciously on the poisonous, or at least indigestible, variety so commonly found in the mangrove swamps.]

9. Dr. Day remarked thatt the mullet was their favourite fish, 262
and "one day, having placed a quantity of different species 136
before them, they helped themselves in the following order:
Chorinemus, *Platycephalus*, horse-mackerel or *Caranx*,
Chrysophrys calamara, and lastly *Tetodon*, or frog-fish, which
latter has generally the credit of being poisonous." My experience is that there are apparently no fresh-water, and but few salt-water, fish⁷ which they will not eat.

10. It is a mistake to suppose that pigs were ever scarce in 136
these islands, for though it was formerly more difficult than at the present day to shoot them, there is no lack of evidence to

¹ *Ide ante* "Medicine," paragraph 4.

² *Viz.*, those of the *Pinna* and *Cyrena* species.

³ This is only attempted when they succeed in surprising the fish before it has time to close its valves.

⁴ *Ide* Appendix B, item 80.

⁵ *Ide* Appendix B, item 18. [Note.—Water is boiled in a *būj*- by the ordinary process, and not by heated stones being dropped into it.]

⁶ That Europeans should swallow these molluscs raw is a matter of considerable surprise to them.

⁷ They prefer the fleshy part of the head to any other portion. To cut a fish is termed *chō*-like, while to remove its head, tail, and entrails is styled *arwā*-like.

- [[36] prove¹ that they are, and always have been, fairly numerous.¹
 224 The pig hunts are most frequent during the rains, not only because these animals are then more plentiful and in better condition, but because it is no longer the *ráp-wáb*, or season of abundance of jungle fruit and honey; from this, however, it must not be inferred that scarcity is then experienced, for those who choose to help themselves need never be in want.

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 252 11. During the cool season, *pápar-wáb*,² the people themselves are alleged to become noticeably thinner: this they attribute not to a deficiency of food, but to the meagre condition of the pigs, which are then breeding, and to the fact that the edible roots (or yams), and other fruits then in season are not fattening. There are six varieties of esculent roots, viz.: the *gō-no*, *chā-ti*, *kād*,³ *bō-to*, *mal-ag*, and *tā-gi*, which are eaten alone (preferably cold), and not with meat; their chief difference consists in the extra care in preparation which some require, in consequence of their very acrid flavour.

12. The *gō-no* is cooked in three ways: (a) it is placed on the fire in the condition in which it is found until it is soft, when it is freed from the burnt earth and eaten; (b) the root, after being washed, is cut up into small pieces and boiled in a pot; and (c) after being washed and cut up, the pieces are wrapped in large leaves and baked on burning logs.

13. The *chā-ti* is cooked in the first of the above-mentioned methods, or by surrounding it with hot stones,⁴ and covering the whole with leaves and weights, in order to confine the heat as much as possible.

14. The *kād* is first cooked as found, the skin is then peeled off, and a number of thin slices are cut and placed in water for a couple of days, so as to lessen the bitterness of its flavour; afterwards it is either baked in leaves or boiled, as already described in speaking of the *gō-no*.

15. The other three varieties are never boiled, but are placed on the fire without leaves, and the outer skin is removed before they are eaten.

16. The seed of a species of sea-weed, known to them as *tō-no-tōng*, on which turtles and dugongs feed, and which can only be obtained in small quantities, is carefully cooked and eaten as a relish.

¹ In his examination of a kitchen-midden near Port Blair harbour the late Dr. Stoliczka recorded that "the large number of bones of the Andaman pig is remarkable."

² This is the period between the rains and the dry season, and lasts about ten weeks, between the middle of November and the middle of February.

³ The *gō-no*, *chā-to*, and *kād*, are very plentiful during the cool season, and are much relished.

⁴ *Vide post* "Stone Implements," paragraph 1.

17. The fruit of three varieties of mangrove,¹ known to them as *jū mu*-,² *ngātya*-, and *bātaga*-, are occasionally eaten, but only by way of change; they are prepared like the *kād*- (vide above).

18. The following table contains a fairly complete list of the different kinds of food eaten by the Andamanese during the varying seasons of the year; their ordinary diet, as will be gathered from the foregoing, consists of pigs,³ *paradoxurus*, *iguana*s,⁴ eggs of the hawkbill turtle, turtles, shell and other sea-fish and prawns, with occasional treats of dugong and porpoise,⁵ and for married persons certain birds, already named: the fruit of the *Pandanus* and black honey must also be added, besides which, during the dry season, fresh-water fish, shell-fish, eggs of the green turtle, honey, the bee-bread, and that portion of the comb in which the larvæ are found, as well as the *Caryota sobolifera*, yams, and numerous fruits, about to be named, are eaten with great relish; while during the rains they vary their fare with preserved seeds of the *Artocarpus chaplasha*, *Semecarpus*,⁶ and the fallen seeds of the *Entada pursaetha*,⁷ with three grubs, viz.: the *būtu*-, *pīrigi*-, and the larvæ of the Great Capricornis beetle (*diyum*-), and certain fruits. Although on one occasion I saw a man (a member of the *ā-kā-ked'e*- tribe) actually eat an *diyum*- alive (!) their usual practice is to collect a quantity of the above-named insects and to wrap them up in leaves and place them on the burning embers, turning the bundle from time to time, so that its contents may be thoroughly cooked, whereupon, in the case of the *būtu*-, after breaking off the tails, they are consumed with evident gusto.⁸

19. The native names⁹ of most of the fruits in season during the dry (a), wet and cool (b) months are:—

¹ Some terrible calamity, such as another Deluge, would result, so they say, from any one rashly presuming to taste the fruit of a certain species of mangrove, called *tōkal*-.
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² *Bruguiera gymnorhiza*.

³ Not only are the sows eaten when with young, but even their unborn litter is not rejected.

⁴ Iguanas and *paradoxuri* are in better condition during the rains, and are consequently more eaten at that season.

⁵ There are special restrictions connected with eating both the dugong and porpoise for the first time (vide post "Tabu," paragraph 2).

⁶ Vide paragraph 32.

⁷ Vide ante "Religious Beliefs, &c.," paragraph 12.

⁸ The *diyum*- is found in newly fallen logs, and they say that they do not treat it like the *būtu*—viz., in breaking off its tail—because it does not live in such rotten Gurjon trees.

⁹ The botanical names of most of these, as well as of many others, will be found in Appendix L.

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- (r) Used for making canoes.
 (s) Resin used in manufacture of *kāngatā-būj*- (vide Appendix B, item 62).
 (t) Used in making the *gōb*-, *kai*-, and sometimes the *tōg*- (vide Appendix B, items 82, 80, and 10)
 (u) Generally used for making paddles, and the leaves for bedding.
 (v) Used for making shaft of hog-spear.
 (w) Used for making baskets, fastenings of adzes, turtle-spears, torches (*tō'ug*-), and of bundles; also for suspending buckets, for stitching cracks in canoes, and in thatching.
 (x) Used for making canoes; the resin is employed in making torches.
 (y) Used for making canoes, pails, and eating trays.

APPENDIX M.

LIST OF SHELLS AND SHELL FISH COMMONLY KNOWN TO THE ANDAMANESE.

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Andamanese name.	Scientific name. ¹	Remarks.
<i>T-d-ā-la-</i> (r)	<i>Monodonta</i> (?) <i>labeo</i> .	
<i>lād-ā-la-</i> (a)	<i>Delphinula laciniata</i> .	
<i>br-</i>	<i>Pecten</i> (?) <i>Indica</i> ..	Scallop.
<i>chā-pata-</i> (b)	<i>Pteroceras chiragra</i> ..	Scorpion shell.
<i>chāu-ga-lōt chū-kul-</i>	<i>Murex tribulus</i> .	
<i>chej-</i> (also <i>chū-la-</i>)	<i>Pinna</i> (?) <i>squamosa</i> ..	Bouquet-holder shell.
<i>chī-d-</i> (b)	<i>Pinna</i> (?)	
<i>chē-kot-</i>	? <i>Conus eburneus</i> .	
<i>chō-rom-</i> (a)	<i>Scolymus cornigerus</i> .	
<i>chū-wai-</i> (a)	<i>Tridacna crocea</i> .	
<i>chū-</i> (a)	<i>Murex</i> (?) <i>palma-rosa</i> ..	Rose-bud shell.
<i>ē-la-</i>	<i>Perna ephippium</i> .	
<i>gar-en-</i>	<i>Dentalium octogonum</i> .	
<i>gar-en-ē-la-</i> (a)	<i>Turbo</i> (?)	Top-shell.
<i>ī-na-ē-la-</i> (a)	<i>Nassa</i> (?) <i>tania</i>	Dog-whelk.
<i>jā-rā-wā-ē-la-</i> (a)	<i>Purpura Persica</i> .	
<i>jīrka-ā-</i>	<i>Cyrena</i> (?)	
<i>jō-rol-</i> (b)	<i>Cerithidea telescopium</i> .	
<i>jā-ru-wā-lā-kā bang-</i>	<i>Solen vagina</i>	Razor-fish.
<i>kām-rāj-</i>	<i>Trochus</i> (?) <i>obeliscus</i> ..	
<i>kū-rada-</i>	<i>Arca granosa</i> .	
<i>kō-nop-</i> (a)	<i>Tridacna squamosa</i> .	
<i>lī-do-</i>	<i>Turbo marmoratus</i> ..	{ Is eaten by the <i>bal-awa-</i> tribe only.
<i>lī-ta-</i> (a)	<i>Cassia glaucus</i>	Helmet-shell.
<i>māl-lo-</i> (a)	<i>Venus</i> (?)	
<i>mā-ē-l-</i> (a)	<i>Venus meroë</i>	Pattern-shot Venus.
<i>mā-rē-no-</i> (a)	<i>Patella variabilis</i> ..	Rock-limpet.

¹ To the Rev. T. L. J. Warneford, formerly chaplain at the Andamans, I am indebted for the classical names of many of the shells in this list.

(a) denotes those that are cooked and eaten.

(b) denotes those that are cooked and eaten by married persons only.

Andamanese name.	Scientific name.	Remarks.
nyê-red-	Mitra adusta	Mitre-shell.
ô-do-	Nautilus (? zic-zac).	
ô-la- (a)	Cerithium (? nodulosum).	
ô-log-	Strombus (? pugilis).	
paî-dek- (a)	Arca (? barbata).	
pail- (b)	Mytilus smaragdinus ..	Sea-mussel.
paîlta- (b)	Pharus (?)	
pâp-ô-la- (a)	Turbo porphyreticus.	
pê-te- (a)	Circe (?)	
pô-rma- (a)	Arca (?)	
pâ-luga lâr ô-lang-	Dolium latelabris (? also galea).	
rê-keto-	Hemicardium unedo.	
rô-kta- (b)	Cyrena (?)	
tâ-ra-ô-la- (a)	Natica albumen.	
tai-lig-pû-nur-	Conus (? nobilis).	
teb- (a)	Bulla naucum	Bubble-shell.
tê-lim-	Cypræa Arabica	Cowry.
"	" Mauritiana.	
"	" Talpa.	
"	" Tigris.	
"	" Vitellus	
tîl-	Cassia Madagascariensis (? also tuberosa)	Queen-conch.
tôi-ña-	Ostrea (?)	{ Eaten many years ago but not now.
tû-a- (a)	Trochus Niloticus.	
û- (a)	Cyrena (?)	
û-chup-	Conus textile	Cone shell.
û-yo-	? Turbinella pyrum, or Pyrula (? ficus)	Shank shell.
wal- (b)	Spondylus (?)	Thorny oyster.
wâ-ngata- (a)	Arca (? granosa).	
wôp- (b)	Ostrea (?)	Oyster.
yâ-di lâr ê-te- (a)	Haliotis glabra (also asininus)	Ear-shell.

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●136 **Marine Fauna.**—The marine fauna of the Andamans is of unusual interest and the aquarium on Ross Island under construction should prove of great scientific value. On examination the marine life goes to show what other physiological facts have proved—the close connection of the Islands with both Burma and Sumatra and the distant alliance with the Indian Peninsula. The land fauna, in several particulars, shows that the Andamans are closely allied zoologically with their neighbours, Arakan and Burma.

Economic Zoology.—The economic zoology of the islands has been thus summarised by Major A. B. S. Anderson.

"The coral reefs and dead shells afford an immense field for obtaining a very fine quality of lime, which has for many years past been used in the Andamans in building operations. Sea cucumbers or trepang are collected, dried and exported to the Chinese market. Wax and honey are obtainable in fairly large quantities in the forests; the honey is, however, of rather poor quality. Cattle bones in large numbers can easily be picked up all round the islands wherever there is a sloping shore. Ornamental shells can be obtained with great ease in the rocky pools, reefs and shallow waters. Edible oysters are very plentiful. Pearls and mother-of-pearl oysters are occasionally obtained, but no systematic search for these valuable products has ever been instituted. The edible turtle and tortoise-shell turtle are plentiful. The former are sparingly exported and the shell of the latter is collected and exported. Edible birds' nests of the finest quality are found in many of the caves in both groups of Islands. They are exported to the Chinese market."

Conchology.—The existing sea shells have been extensively collected by local residents for many years past, but there does not appear to be anything specially distinctive about them, and the various species have been incorporated into the general standard works on conchology. The presence of *scalaria preciosa* and of *argonauta argo* is noteworthy. But the land shells are more distinctive in their nature, and seem to corroborate the evidence procurable from the flora and the fauna of the Islands. They have received a good deal of attention both from scientific expeditions and from local collectors. There was a well appointed expedition fitted out by the Danish Government in 1846, in the frigate *Galathea* in which the zoologist, Reinhardt, first paid much attention to the mollusca. The conclusion apparently to be drawn from such knowledge as has been accumulated is, on the high authority of Godwin-Austen, that there is a distinct and close relationship in the past shown with Burma and Arakan by many closely allied species, and equally marked is the paucity of forms having an alliance with Peninsular India. On the other hand, some species are common to these islands and to Sumatra and Java.

137 **Forests.**—A section of the general Forest Department of India has been established in the Andamans since 1883 and, in the neighbourhood of Port Blair, 156 square miles have been formally set apart for regular forest operations. The activity of the department is strictly limited by the amount of convict labour from time to time available, as there is no indigenous labour whatever. The annual value of forest produce used in the Settlement during the last seven years has averaged ₹1,13,683, and the annual value of exported timber has averaged for the same period ₹1,69,633. This last product is increasing rapidly in value.

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137 **The Timber and its Economic Uses.**—The timber available for economic purposes is both plentiful and various. It is divided for commercial objects into three classes, known by their commercial names thus:—First class, Padouk, Koko, Chuglam, Marble-wood, Satin-wood; Second class, Pyimma, Bombway, Chai, Lakuch, Lalchini, Pongyet, Thitmin, Mowha, Khaya, Gangaw, Thingan; Third class, Didu, Ywegyi, Toungpeingyi and Gurjan. Padouk is the chief timber for export to Europe at a very high price per ton, but other first class timbers also find a market there. Third class timbers find a ready market in Calcutta, while the second class are extensively used locally.

The trees chiefly used as timber by the Andamanese for their own purposes are mangrove, padouk, *melochia velutina*, some of the *sterculiaceæ*, *bombax insignis*, *areca lara*, pandanus, bamboo, *anadendron paniculatum*. They also gather and eat the fruit of a great variety of trees and use the leaves of the following for medicinal purposes:—*trigonostemon longifolius*, *alpinia* species. *Calamagrostis laciniosa*.

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jungle all day long: found absolutely nothing but very old tracks; could not get on to any big path, and eventually, after walking many miles, got on to the main *khari* from Port Anson and walked up to our camp. Mr. Rogers arrived half an hour later. Mr. Bonig had arrived at 10 A.M. from Port Blair and left a note to say that he had gone off hunting. He did not return that night. Mr. Rogers reported having discovered the main track south and a big encampment.

23rd February.—Waited until about 9-30 A.M. for Mr. Bonig, when, as it seemed doubtful whether he would turn up until evening, Mr. Rogers and self decided to move camp to the big hunting camp discovered by him. We accordingly packed up, and each shouldering a load as before, we set off and tramped about 6 miles along a Jarawa path to the hunting camp. The road lay due south and we only climbed a couple of hills, the rest of the way being along the slopes, and along a broad stream, some 20 yards broad, flowing due south; although only 6 miles or so off, we went so slowly, carrying our loads, that it was 2-30 or so before we arrived. The hunting camp was similar in construction to several I found, consisting of six huts facing a well cleared open space. It was on a hill top and had several paths running up to it. Water was close by Gorlakabang.

[Note.—Mr. Vaux was killed on the 24th.]

Extract from the Diary of Mr. C. G. Rogers, Deputy Conservator of Forests, from the 17th to 26th February 1902.

17th February.—Left Port Blair in the *Belle* about 5 P.M. and reached Macpherson's Straits soon after sunset and anchored there for the night.

18th February.—Left Macpherson's Straits at daybreak and steamed up the West Coast of the island and through the Labyrinth Islands to the place called Talaplontga on the Andamans Topographical Survey Map (2 miles = 1 inch). Mr. Bonig found a passage through the coral reefs and anchored about a quarter mile from the shore and the estuary of the stream which enters the sea here. The Andamanese call it Bajaluntá. We landed with Andamanese to look for Jarawa tracks, camps and houses. Mr. Bonig went to the bay to the north. Mr. Vaux and self went up the estuary and landed at 11-15 A.M. He went to the south and I continued up the *khari*, and at 11-40 the Andamanese with me came across some fresh Jarawa tracks. We followed these up, and at 11-50 Mr. Vaux and his party caught us up, as the tracks they had found led them to the *khari* up which I had gone.

Each of us (Mr. Vaux, Mr. Bonig and self) had four or more Andamanese and three policemen, leaving three policemen on the launch.

Sharks were plentiful where we landed and the Andamanese shot two, one of which was killed, the other going off with two arrows in it. The one killed was about 3 feet long.

Where Mr. Vaux had caught me up, the *khari* branched. Mr. Vaux followed up the more southerly of the two streams and I went up the northerly one.

The *khari* I followed went generally north. We crossed a ridge running north and south and came into another branch of the *khari* and followed it up. On another ridge, which we reached at 12-10 (noon), was the site of an old hunting camp, which had not been recently used.

At half past twelve we left the *khari* and went through the forest on the eastern and southern flanks of the intersected point marked 677 (height in feet) on the map above referred to. We did not find any new tracks of Jarawas until about 1 P.M., when we found some new tracks, including those of two young children, and following up these tracks came upon a fresh hunting camp, which had quite recently been left, as the fires were still burning. Flies were thick on the pieces of fish which had been thrown away and some cooked fish (whole) were found in the shelters in which the Jarawas had slept, and this was eaten by our Andamanese. The pigs' skulls were found and taken away. We followed up the fresh tracks from this camp and they took us back to the *khari*, at the point where Mr. Vaux and myself had separated in the morning.

As it was late and I was very tired, not being very well, we returned to the boat, which we reached at 5-30 P.M. and waited till midnight for Mr. Vaux, who did not turn up. About 7 P.M. we heard the report of a gun, and thinking that perhaps Mr. Vaux had been benighted and was trying to find his way back to the boat, fired a shot in return and waited. About 9 P.M. we heard another shot, which we thought was nearer, so replied to it. The next shot we heard, about an hour afterwards, seemed to be further off, so after waiting till midnight, I decided to go off to the launch and return to the landing place at daylight. Reached launch at 1 A.M.

At that time I never dreamt of Mr. Vaux's having found any Jarawas. I only thought he had been following up fresh tracks and had gone too far to return to the ship that night.

About 8 P.M., while waiting for Mr. Vaux, we heard shouts to the north of us. The Andamanese suggested that the sounds were those of Jarawas. I said I thought it was Mr. Bonig's party returning home, and on my return to the launch, I found Mr. Bonig there, and he told me that they had had to wade a good deal of the way home and had to shout to keep off sharks. He was up to his neck in the water and more than once was attacked by large sharks. The Andamanese would not come into the water and Mr. Bonig had to send for them after he had reached the launch. The tide was out when we landed. It was full when we returned, and so Mr. Bonig's boat was some way from the shore on his return. The Andamanese called the place we anchored at Bajaluntá.

Some poles at the camp we found had been cut with some cutting instrument, while a tree in the camp was hacked with what looked like (judging from the incisions made) an adze.

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[334] torches for hunting by night. There were pigs everywhere. In half an hour we often got six or more of them. At Chemale, far from the coast, we had eleven in a few minutes for distribution to everybody, including roaming Onge. Pigeons and ducks also were often plentiful. The simple pleasures of hunting incited everyone to a spontaneous daily struggle through the dense forest; and so, every month, I managed to carry out many times the work I could have done had I not kept all the men glad to follow me. On seven different occasions I spent 162 days in Little Andaman, out of a total of 634 days altogether in the Andamanese Archipelago - all of them given up to Onge research. These trips are recorded in Port Blair Government offices. A few details on the subject are published in the "Bulletin of the Department of Anthropology", Government of India, starting in Vol. II, No. 1, 1953 (issued in 1956) and extended to other issues. Such papers were hurriedly prepared by me while I was halting in Calcutta on my way from the Andamans to Europe. Press proofs could never be submitted to me; there are, consequently, many misprints, particularly in the figures relating to my Onge Census. The misprints are so obvious that they could only influence a most biased critic: to be discussed in future papers and while my Onge book is in preparation. In Port Blair (South Andaman) I started an Onge Museum with material collected by me. I had the honour of inaugurating it on 6 July, 1953 in the presence of the Chief Commissioner for Andamans and Nicobars, Mr. A. K. Ghosh, one of the kindest and most intelligent Indian gentlemen that it was my pleasure to meet in Asia. On 9 March, 1954 Dr. RAJENDRA PRASAD, President of the Republic of India, also visited the Museum. On that occasion I introduced to him 30 of my Onge friends (wives, husbands and children) in their most natural attire. The President questioned me at length on Onge anthropology and ethnology with the pertinence of a specialist.

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[21] While in Little Andaman I tried to study all possible aspects of Onge life. I also tried to count the natives: a very difficult task for they are a nomadic people, ready to vanish into the jungle at any moment. Often I was surrounded by them without seeing a single one. In the darkness of their jungle, the small, black, naked Onge easily disappear. They see us but we do not see them. They can only be counted in their sleeping quarters in communal huts: even so, results are misleading. I found a number of communal huts in the interior regions of Little Andaman, whereas previously they were said to exist only on the coast. The larger, more solidly built huts are in the forest. With the help of my Indian assistants I obtained plans and photographs of all the huts that I saw. Unfortunately the number of Onge communal huts is rapidly diminishing - a very significant fact. Many are in ruins, many more completely destroyed. Only kitchen-middens and occasional clusters of planted bamboo indicate their former location. Through an interpreter, and with two Onge speaking a little Hindi, I was able to gather information on these and other matters. Direct observation, however, proved the best way of gaining knowledge. In some places there was nothing to help me, and I was compelled to guess about communal huts whose inmates chose to hide in the jungle. Of the many personal names that I collected I must say that they are reliable only for a short period: the Onge like to change their names from time to time. All this, in addition to the Onge's nomadic way of life, causes great confusion and makes a proper Census almost impossible. Frequent changing of names also hinders the establishment of genealogies. Furthermore, the Onge custom of adopting children shifts many of them from one family to another, and adoptive parents invariably claim them as their own offspring. The parents themselves, who are ignorant of numbers, not infrequently forget how many children they have, who these children are and where they are located. It was almost useless to follow previous information concerning communal huts; and so I decided to consider mainly the situation existing at the time of my visits. The result of my Census may be imperfect, but before criticizing it it would be advisable to know the conditions that prevail in anthropological work among the Onge. Something more than merely counting people, anyhow, was achieved by me in Little Andaman.

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In this short paper I am pleased to present a peculiar aspect of Onge life, an aspect that these innocent and once hostile people did not attempt to hide from me, though they also told me nothing about it. Only direct observation could help, and it involved pro-

[364] spot for centuries leads to the formation of kitchen-middens¹. In the tempo-
[367] rary camps something similar happens: the only difference consists in the
fact that rubbish dumps only accumulate at the back of the temporary shelters,
as a consequence of their peculiar shape that I shall not describe here. These
[136] dumps are heaven-sent love nests for insects of many species, mostly flies of a
metallic green colour. They follow the Onge from camp to camp and thrive
on scraps from human meals. When travelling in Little Andaman I was
unmistakably warned of the nearby presence of Onge camps by the ap-
pearance of those familiar living beings.

[136] The filth that coats the floors of communal Onge huts offers an ideal
[352] breeding ground also for myriads of fleas. Dogs spread them all over Little
Andaman. Owing to the fact that the communal huts are deserted for months
at a time during the dry season, the fleas become hungry and assault human
beings vehemently whenever possible. When visiting empty communal huts I
[123] myself, and the persons with me, were plagued by such assaults. Fleas advanced
suddenly from feet to head in thick, shimmering brown layers, covering first
our legs. We were obliged to strip and douse ourselves with insect-repellents.
As for other parasites, including ticks and mosquitos, equally plentiful in Little
[136] Andaman, the Onge do not appear to be inconvenienced by them.
[825] 764

The communal huts are used for another purpose as well, unhygienic
but of high ethnological interest: the interment of human corpses. When they
die, the inmates are buried beneath their beds. In other words, communal huts
are also cemeteries. Many human skeletons are found by digging under the
beds. Until 1952 this fact was unknown about the Andaman Islanders although
it is encountered in all Onge communal huts without exception. An analysis of
[775] this custom led to further discoveries: the Onge wish to compel the spirit
of a deceased person to remain close to the living as a protection, so they offer
it the communal hut for an abode, the idea being that a spirit cannot wander
far from the bones of its former body. A series of Onge practices point to this
[727] belief: felled enemies must be burned and reduced to ashes in order to render
them harmless. Their hostile souls, according to the Onge, rise toward the sky
in smoke as the bones are consumed. For the same reason, bones of relatives
[301] are fashioned into necklaces. The most conspicuous of these is the *ibidanghe*,
[765] worn generally by women and young girls, which is made from a decorated
human jawbone. The aim is to obtain the assistance of the departed relation
[751] in fighting illness and bad luck. Direction in hunting, fishing and even quar-
[777]relling is supposed to come from the dead kept close to the living. We can
trace this belief on the connection between bones and souls to a remote origin:
[171] Southern Asia megaliths had, in my opinion, no other cause for offering shelter
to spirits and promoting useful relations between the living and the dead. I
reached this conclusion after studying the contemporary habits of Travancore
mountain and other Indian tribes, particularly the Munda. In Nias we find traces
of the same customs as among different peoples of Indonesia and Oceania, who

¹ I discussed this at the two international anthropological congresses of 1952 (Vienna) and 1956 (Philadelphia), and have more to say on the subject in my book about the Onge.

now follow them, often ignoring their original significance and symbolism. Among the Onge, spirits are feared but not loved; the same applies to God Himself. 775

The Onge bury their dead in trenches, no deeper than three feet. Earth is tightly packed over the graves in order to prevent exhalations. Full details on the subject of Onge burial customs appear in the book that I am writing about the Onge. I slept with the Onge in communal huts that contained fresh graves, without suffering any inconvenience from the smell of the corpses. This recalls the palaeolithic sepulchral caves, where man probably lived as the Onge live in their sepulchral huts today. 764

There are no latrines near Onge camps - whether permanent or temporary. Excrements are spread carelessly all around, lightly covered with leaves and earth. Flies lay eggs on them. The Onge's only precaution is not to defecate where drinking water might be found after rainfall. With so many opportunities for reproduction, in some places flies form such clouds as to impress the natives themselves. In the north of Little Andaman a creek was named after the flies: Bumila Creek, which means "fly creek". Smells also occasionally inspire geographical names: Tambe-é-bu'e, on the north-east coast of Little Andaman, means "the smelly place" in the Onge language. Flies, fleas and ticks are tolerated by the Onge who do not fight them. Fortunately, the hymenoptera collect flies for their nests, not, however, in quantities large enough to compete with the fertility of the species. 514
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2. Clothing and personal care

The only garment worn by Little Andaman women is the *naquināghē*, a scanty grasslike apron covering the genitals. In addition, during menstrual periods, Onge women wear the *balaghē*, for hygienic purposes. This is a simple cluster of long, soft green leaves cut by the husband for his wife from special trees: *Myristica longifolia* and others. The only leaves used are those from the end of a stalk, a section of which is left attached to the leaves. The stalk is slipped under the *naquināghē*, while the long leaves are passed between the thighs to be fastened at the back above the buttocks. It is curious to see Onge women in such myristical attire! The *balaghē* is ethnographical news, new not only as regards the Andamans: it is an interesting indication of the hygienic measures employed by primitive people, and can probably be traced to prehistoric practices in analogous circumstances. The continental and insular regions nearest to the Andamans have retained no similar custom; their only practice is the strict isolation of menstruating women. Among the Onge, on the other hand, they are allowed free circulation. Washing is unknown to the Onge: they never wash their bodies intentionally. Brushing through the thick forest and diving into the sea or the river to collect food substitute adequately for washing. The Little Andaman forest is nearly always dripping; moving among the trees, specially in the early morning, is equivalent to bathing. The contact of wet leaves when walking cleans the Onge's skin, for they go naked; and as they constantly dive into the sea and rivers, they do not smell. Actually they give an impression of cleanliness - as opposed to many other dark-skinned 291
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312 carcases of small animals. During the droughts, marine hermit crabs, of
271 which a profusion is found in Little Andaman even far from the sea-shore,
196 often choose to die in fresh-water pools. They are not removed from the pools.
415 A nautilus shell is sometimes used as a drinking vessel ; failing this, the Onge
516 lap up the water like animals, on all fours, directly from the pool. Since they are
231 very fond of dogs, man and dog drink together from the same tiny pool, often
holding no more than a few pints of water. Dogs reached Great Andaman as
early as 1857 ; they came to Little Andaman much later. Before that time
there were no dogs in the Andamanese Archipelago. They soon became the
natives' cherished and much appreciated assistants in the hunting of wild pigs.
Many unhygienic habits followed the appearance of dogs in the Andamans.

271 The Onge have no idea of boiling water for the purpose of disinfection ;
147 nevertheless their health does not appear to suffer at all as a result of the pol-
123 luted water they drink. When, in 1952, I dug a well near the left bank of
Dugong Creek on the north-east coast of Little Andaman, I was compelled to
fence it in so as to prevent dogs from drinking it and bathing in it.

264 Dogs lick everything that smells of food, including the cooking pots,
231 and the pots are not washed before use after the dogs have licked them.
136 Swarms of flies of different species and small coleoptera of a brilliant blue
colour, one of them 6 mms long, follow the dogs after they have "cleaned" the
pots by licking them. They line the inside of the pots with a crawling, living
coat, moving restlessly around in search of food. One species of fly, which is
of a brilliant, metallic green colour, has a peculiarly disagreeable smell. All
the flies lay eggs while feeding, but the eggs are soon devoured by the hovering
bluish coleoptera. Thus in a few hours all traces of organic matter disappear
from the pots. Subsequent exposure to fire undoubtedly destroys the germs
that would otherwise be certainly dangerous to human beings.

415 The Onge no longer use indigenous pottery for cooking. Its disappearance
177 is recent, as the sherds that litter Little Andaman prove to the investigator.
323 Excavation in modern kitchen-middens leads to the same conclusion. During
the last war, quantities of empty petrol drums were washed up on the Andaman
shores. They were found in such numbers that the Onge have not yet
used them all up : after 1952 I found several of these containers abandoned,
untouched, in the jungle. The primitive inhabitants sawed each container in
two cylindrical halves, thus transforming them into cooking pots. The result
was that within a few years the fragile ancestral pottery of the Onge disap-
peared altogether. Furthermore, aluminium pots were distributed among the
natives after 1952. Probably the indigenous pottery will never again reappear.
252 Each half of a petrol drum is large enough to contain a pig, or a turtle weighing
262 150 lbs, cut into pieces. Only the flesh of these animals is consumed by the
231 Onge ; the nourishing broth is poured out onto the ground or left in the pot
to be lapped up by the dogs. The Onge believe that broth is unhealthy and
avoid drinking it.

251 No matter how prodigious the catch of sardines or other fish, unobtain-
185 able at other times of the year, no attempt is made at storing part of it in
view of future shortage. The Onge are unacquainted with methods for preserv-

164 do they suffer from the eye infections that are so common in the tropics. Their
151 highly trained eye can distinguish at a great distance small vessels on the
troubled waters of the sea that people with normal eyesight could not perceive
without a telescope. Normal vision, I suppose, is the same for the entire human
123 race; but we exercise our eyesight less. In the dark fastness of the jungle, the
151 Onge were able to point out birds sitting motionless high up in the trees,
quite invisible to me notwithstanding my experience in collecting even the
tiniest specimens. With their sharp eyes they sought out for me a collection
of minute mimetic amphibians living far from the ground on tree trunks,
previously unknown to science. The same thing often happened when I was
unable to see as far as they did. The help of my savage friends was invaluable
in avoiding the poisonous snakes that we met with daily in our camps or while
travelling. For our protection, the Onge always marched in front of my men.
They could discern reptiles hanging from branches among thick foliage, wait-
ing to bite us on the neck, or lying perfectly still in the tall grass, ready to
attack our legs. The only trouble we had with snakes was when the men I had
brought from India, in moments of enthusiasm ran ahead into the interior
of the jungle, eluding their Onge vanguard.

752 The Onge themselves, however, are sometimes bitten by snakes, with
123 dire consequences. Happily the Andamanese snakes are less deadly than the
136 same species on the continent, and few deaths occur from snake bite; but it
[222] can curtail a man's activity for several months. In March 1953 an Onge friend
of about 25 who had climbed a tall tree to collect honey, inadvertently seized
with his left hand a snake concealed in a tuft of creepers, and was bitten above
the elbow. Frightful swelling ensued, together with shooting pains and a
raging fever. The man was brought to me unconscious, his left arm had already
assumed the appearance of a huge, rigid, elongated sausage. The Onge had
smeared all his body, and particularly the wounded arm, with ochre mixed
with honey, turtle fat and rough clay. They have no specific remedy for snake
bite. It was too late; but in an attempt to save the patient an antiophidic
injection was practiced on him. Within a few hours he appeared to rally. I saw
him again after eleven days; his arm had been treated in the Onge way and
put in a sling made of ficus bark cut into narrow strips. Fever had disappeared,
and in part also the swelling, so he could move his elbow a little. The skin
peeled off the whole length of the arm. Where the fangs had entered the flesh
two round, red, suppurating wounds, 1 cm in diameter, were discernible under a
layer of clay and honey. The man recovered in about two months. During his
476 illness the people who shared his communal hut exempted him, his wife and his
children from all work, and supplied them with all requirements. This occurs in
every case of illness, showing the complete solidarity that prevails among those
simple people - once considered ferocious. Always, if the wife is ill, the husband
is automatically relieved of his hunting, fishing and food-collecting duties.
Friends provide food for the family, no matter how many the members thereof.

164 In Little Andaman, we Europeans are constantly threatened with mala-
143 ria. How we fail to take all necessary precautions we would catch it upon
setting foot on the island. The Onge are all infected, but it does not upset

Onges

THE ANDAMAN ISLANDERS

175 colonel who had accompanied him. After a series of similar inci-
648 dents involving other people Portman went to Bumila Creek on
10 November 1891, for revenge. A number of Onges, including the
one responsible for wounding the colonel, were captured and taken
to Port Blair.

Other visits by various people followed, always very brief and
always limited to the coast, but there were no landings of note.
Various expeditions visited the coast of the island for a few days
and even made contact with some of the Onges, but the interior
114 of the island remained as unknown as before. In February 1951 I
122 accompanied one of these expeditions, which again did not go
beyond the coast. Those five days on Little Andaman were most
revealing, and enabled me to plan the landing I subsequently made
in 1952. I saw that the island was teeming with game, that wild
● [136] fruit and edible roots were plentiful, and that the sea round the
island was full of fish, lobsters, huge crabs and turtles. Moreover,
the turtles laid eggs in the sand where it was very easy to find them
by following the beasts' tracks. I realized that it would be unneces-
sary to bring in provisions, and that it would be possible to enter
the forest unencumbered with anything more than guns, cartridges
and a few cooking utensils. Every day during this short stay I went
with a police escort as far as possible into the forest in order to
reconnoitre. In some places I noticed recent traces of small bare
feet, but no Onges appeared.

122 Realizing that mobility was essential for any expedition into the
interior of the island, I prepared at Port Blair a number of small
watertight metal boxes to hang from the shoulder, to take a mini-
mum of necessities. The largest items in my own personal baggage
were a mosquito-net, a very light hammock and note-books. Car-
tridges were to be divided among the boxes. Tents, camp-beds and
other large equipment would have to be left in a base camp, which
would be established on the coast and left under police guard with
radio transmission apparatus for communication with Port Blair.
If necessary, a portable radio could follow us.

121 Several factors made me want to return. There was the mystery
of the unknown interior of the island. There was the prevailing
lack of information of any kind about the Onges, even of their
numbers. I wanted too to carry out an investigation of their somatic
characteristics, using the greatest possible number of individuals.

Onges

THE PEOPLE OF THE ISLANDS

The Onges do not seem to require any preventive measures, and seem naturally immune to malaria. They do, however, transmit the disease to strangers, through the mosquitoes which are everywhere in Little Andaman. Like many other inhabitants of tropical areas, they probably all carry the disease without being affected by it – neither children nor adults show any sign of splenic enlargement. 164 [36]

In contrast to their periodic gorging, the Onges will equally cheerfully endure hunger, thirst and exhaustion. During our hazardous canoe trip to South Brother, however, they appeared much more affected than I was by long exposure to the sun. We were completely without any means of shelter for an entire afternoon in the open sea, and though the Onges tried to cover their heads as best they could, they still developed severe (and genuine) headaches, and were clearly much happier in the dark forest, which must be considered their natural environment. 147 [26]

Nothing has hitherto been known of the intelligence level and general psychology of the Onges. The childishness of their behaviour, however, is curiously in keeping with their strikingly child-like appearance. Like children, they seek only the satisfaction of elementary stimuli, and like children they pass in a flash from one mood to another, so that they are a people of sudden contrasts. 15

One example is their passionate love for their dogs, in marked contrast to the intense cruelty with which they hunt their prey. Having once realized the usefulness of dogs, first imported into the islands some thirty years ago, the Onges now pet them like little girls with their dolls, and the Onge women will suckle the family puppies quite naturally with their own children. Yet once a dog dies the other side of the Onge nature comes to the fore and the carcase is thrown into the forest – there is no looking back. 231 [52] [77]

Their minds are in a sense inventive, in that they have evolved devices to help them acquire their food, but they have never, for example, thought of the fish-hook, despite the abundance of iron pieces thrown up by shipwrecks all round the islands. Anything new is taken up with a child's momentary enthusiasm, but they have no notion of sustained mental effort such as any form of counting. 157 [802]

Like children, too, the Onges laugh at the slightest thing, although their mirth is always restrained. In this they differ from the African peoples, particularly the Bushmen, who are often by 157 522

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the Onges as hiding-places or temporary shelters. In these cavities, which remain full of water right through the dry season, flourish a horde of amphibia, many hitherto unknown.

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The great trees are sometimes so close together that it is literally impossible to pass between them, yet it is rare to find two of the same species next to each other, so great is the variety. Huge clumps of ferns are everywhere, hiding the roots of dying trees, hundreds of years old, and fallen trunks rotting on the ground. Some of the thicker and taller trees protect themselves from the monsoon gales by developing buttresses, usually four or six to a tree, which stand out from the trunk like right-angled triangles, with the apex about ten metres from the ground. If a blanket is stretched between the sloping sides of two of the buttresses one can improvise a shelter which is extremely comfortable by local standards, and both man and animals take advantage of this natural cover; I myself took shelter like this on many occasions. (They need to be treated with caution, however, as the local snakes have a predilection for siestas in the darkest corners.) If a hard piece of wood is struck against one of the buttresses it echoes hollowly, and the Andamanese often make use of them to transmit warning messages over considerable distances, using a form of code. A few beats can make every inhabitant within a wide radius vanish from sight, hastily making for the nearest hiding-place. It is hopeless to try and ferret them out once they have been warned, and there is always a risk of being killed by one of their arrows in the process.

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Sometimes the Onges used to disappear suddenly for fun. The blackness of their skin is a great help in this, since even on the brightest afternoon it is intensified by the obscurity of the forest. One has a disturbing sensation of being entirely alone, yet knowing that dozens of pairs of eyes are watching as the Onges glide silently from trunk to trunk between the buttresses.

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The whole island is a mass of knotted vegetation, and it is useless to attempt to cut any form of lasting path, as the plants immediately grow back. 'Walking' in the Andamans therefore means opening up a way with a hatchet, unless one adopts the rapid but exhausting Onge method of swinging over obstacles by the lianas. This is the kingdom of the epiphytes. The lianas cover their hosts as if determined to hide them, and clumps of orchids hang from nearly every trunk, although their flowers are unfortunately very small.

THE SILENT FOREST

It is impossible to imagine a more varied or richer sight than the Andamanese forests at any time of year. The colours, and the light effects, particularly at dawn and at sunset, the myriads of flowers of every hue and scent, every shape and size, the strange noises, all combine to produce an effect which stuns the outsider. The spectacle reaches its climax at night when the moon is full; the tops of the trees are bathed in a silver light and the great lianas seem to writhe like serpents. As though inspired by the light, the nocturnal animals stage a kind of pageant for the occasion and their cries are even more frequent and more rhythmic than usual. The Andamanese themselves seem bewitched without realizing it, spellbound by the weird atmosphere. [36] ●

To anyone unfamiliar with the tropics, the swift change from darkness to light and back again comes as a surprise. Night in the tropics is never silent – the eerie voices and calls, often with a strange pitch, seem to cease for a brief moment just before the sudden onset of darkness and again just before the return of the light. As night falls the fascination of the jungle grows. Even the natives feel some urge to keep their voices down, as if out of respect for some natural solemnity. (This, however, is not exclusive to the Andamanese, and it has a perfectly rational explanation. In tropical forests, and in the deserts, men speak softly so as to catch every slightest sound, a passing animal perhaps.) At dawn the birds start up as though they were tired of silence. There is no great variety of calls; most are very piercing, although still pleasing, and in the crescendo of sound which follows the dusk and dawn silences, the forest is transformed. 13

One thing that has helped the Onges to survive so long despite the inevitability of their decline is the climate of the islands, which is usually very pleasant and so less liable to exacerbate biological weaknesses. 132

Normally, the Andamans have four months of very good weather from December to March, which may extend by a few days into November and April. February is nearly always the driest month and the calmest, although there are exceptions, as I know from my own experiences when trying to land on the island. In the remaining months there is frequent rain, sometimes torrential, with raging seas, but relieved by periods of clear sky.

THE SILENT FOREST

their arched vaults of roots, strong enough to bear a man's weight without bending. In some places I had to travel hundreds of metres across them, clambering from arch to arch, before I could reach dry land and sweeter air (the air in the swamps is foul with the stench of dead fish, crustacea and debris of all kinds from the sea, caught in the network of roots). Among the roots swarm crabs of all kinds, including the blue crabs, while kingfishers and other brilliantly coloured birds dart gaily in after the easy prey. 137

Near the mangrove swamps, in the mouths of the rivers, giant fronds of the Nipah palm stick up out of the water here and there. The feathery fronds, standing several metres high, are used by the crabs to climb out of the water and tiny toad fish, (see p. 133) equipped with both gills for life under water and lungs for air breathing, like to cling to them for an airing when there are no stones handy. Every day these fascinating little creatures stay in the sun for hours before dropping back into the waters of the swamps and in some places they are everywhere, always ready to jump out of the water on to a convenient projection to have a look at what is going on. 136
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The Andamans, with their luxuriant growth of vegetation of all kinds, are an ideal place to study plant dispersal. I have already mentioned the *Ficus* and the mangroves, but there are many other equally fascinating plants. Some used by the Onges for the production of fibres are widely distributed from India to Malaysia and the Pacific. Among these are *Gnetum gnemon* and *G. macrocarpum*, generally spread by the doves which flourish undisturbed on Little Andaman. In April, when the winds come, swarms of curious elongated parachutes equipped with an air trap which causes their spinning flight are blown from *Pterocarpus dalbergoides*, which provides the well-known *padak* wood. The weight of the seeds (the size of a pea) at the base of the parachutes and the effects of the air trap give them a horizontal, screwing flight which carries them far from the parent tree. I have seen these parachutes in the sea, hundreds of kilometres from the nearest land. Mathematically designed by Nature to trap the right amount of air, the tiny parachutes are barely ten centimetres long. Their efficiency is self-evident - *padak* is one of the most widely spread trees in the archipelago, in the Nicobars and far beyond. 137
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In the stagnant pools on Little Andaman I found a species of explosive fungus which closely resembles, if it is not in fact identical

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151 regular exercise of the two faculties required by their existence in direct contact with the natural world; anyone, it is said, who lived such a life would preserve the same keenness of eye and ear.

[164] Certainly I saw no myopia among the Onges, nor any of the eye infections common among other inhabitants of the tropics. With the naked eye they can pick out tiny craft far out to sea, or the small, narrow Onge canoes which I could hardly see with field-glasses, which makes me doubt whether constant exercise of the eyes can really be the full explanation of their power of vision. They can pick out quickly and accurately birds immobile among the dense leaves in the darkest part of the forest, invisible to me, even though I was used to looking for them and could see them when they moved. And from the ground they saw high in the trees tiny amphibia which I wanted to catch, after I had caught one by chance which had proved to be a new species. These amphibia, perfect mimics, become almost invisible when they attach themselves to the bark of the trees, but the Onges pointed them out to me from a distance with absolute accuracy, and I was in fact able in 1954 to catch over two hundred in a week.¹

825 The Onges can also pick out reptiles on the ground, or among
151 the foliage, distinguishing with long practice the poisonous
114 varieties which abound in the islands, and I found it very useful to send Onges ahead of me in the forest to look out for these snakes. When any of my Indians were bitten it was always because they thought they could do as well as the local scouts! The Onges themselves are, however, occasionally bitten, with serious consequences. One of them, aged twenty-five, climbed into a very high tree after honey, and unwittingly put his left hand on a snake hidden in the leaves, where it had climbed to search for birds' eggs. It bit just above the elbow, causing an alarming swelling of the arm with severe pain and fever. He was brought to me semi-conscious, with the whole limb swollen to the size of a rugby ball. The unfortunate
[752] man's neck had been bound with the usual strands of *Ficus* bark, and not surprisingly he was groaning desperately, and clearly on the point of death.

752 The Onges have no specific remedies for snake bites, and their
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[136] ¹ These amphibia were examined in 1954 at the Institute of Zoology of the University of Genoa and given the name of *Kakula balata ghoshii*, in honour of Mr A. K. Ghosh, then Governor of the Andamans.

THE SPIRITS OF THE FOREST

ancient times. Great Andaman abounds in these man-made humps, to which the name 'kitchen-middens' has been given, but none are in use today. In Little Andaman, on the other hand, many are still being built up.

The sweeping operations disturb clouds of flies and tiny beetles, light brown in colour, shot with metallic blue, with a highly domed back, and about five millimetres long, which always collect under bones and other human food refuse. Hordes of fleas, invisible in the dirt on the floor but multiplying busily, are also stirred up. Fortunately there are no lice on Little Andaman, owing to the absence of clothing and bed-linen, and the Onges carry no lice in their hair.

In fact the dogs' coats carry the fleas from place to place more than do their naked, smooth-skinned owners. Every time I went into a hut which had been empty for a time, as happens in the dry season when the occupants are away on a hunting trip, I was assailed by swarms of fleas such as I had never imagined! They rushed up one's body from feet to neck in absolute serried ranks, platoons of them, solid masses of tiny black moving objects. The only thing to do was to go out into the open and douse oneself in Flit, which caused them to retreat hastily. My camp-bed was always given a precautionary dose. Unfortunately Flit was not enough to disperse the clouds of ticks, tiny but dangerous, and a scourge in the forests of the Andamans. The Onges call them *anagbe* and thoroughly enjoyed helping to catch them on me in hundreds after every expedition into the forest.

None of these pests worry the Onges, who make no attempt to get rid of them. They leave mounds of filth round their huts or in their forest camps for them to breed in, and the light covering of earth or leaves which at best cover the Onges' faeces, deposited near the camp, was never any deterrent to breeding. The Onges never dig sanitary trenches or prepare any other form of latrines, even for their permanent sites; the forest is all concealing. However, they will never defaecate near, or in, a water course, even when the bed is dry, and when my men used the bed of a dried-up stream for the purpose the Onges protested to me, because the water would be contaminated. I was not disposed to contradict them.

In the forest, meeting a swarm of flies was a sure sign that we

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● 136 were approaching an Onge camp. Everywhere they go they are accompanied by flies of all sizes, and in Little Andaman the swarms are so bad that the first stranger to land called a river after them, Bumila Creek, or fly river. Their flies betray the Onges long before the barking of their dogs - no human voice ever betrays their silent presence.

628 On Little Andaman today the Onges' tacit divisions of territory
423 are of little importance, so heavy has been the fall in population,
123 but they still keep out of areas belonging to other 'huts', even if the huts themselves have been abandoned. I never saw any disputes over territory, or the ownership of the area in which a pig was caught (and hence ownership of the pig). The Onges who accompanied me, possibly encouraged by the prestige value of a European with them, hunted wherever we went without anyone raising any protests. Nevertheless, I always took the precaution of giving anything I or my Indians took to the Onges of the nearest hut, invariably much to their delight.

342 Contrary to established opinion, communal huts on Little
361 Andaman are not found only along the coasts; the majority, and certainly the best constructed, are in the interior. Togalanghe is one, and there are a number of permanently abandoned temporary camps near it.

342 Both the permanent and temporary huts or shelters of the
191 Andamans resemble those of the Semang. The latter are extremely simple, especially in the dry season; there are no walls and only a very sloping roof of leaves, high at the front and very low at the back, the beds being put so that the feet face the low part of the roof. With the Semang and Aeta the beds may be made of bamboo; 352
171 this is never the case in the Andamans, as there are no large bam-
137 boos in the archipelago (Brown was wrong in this respect. The
114 few slender bamboos on Little Andaman are only usable for making
417 drying racks, which are found only round the hut at Beniabol in the south. As the people were away when I went there, and the site was consequently completely deserted, I was unable to establish visually what they dried, but traces of fish, particularly pilchards, were indication enough.)

342 These temporary shelters are put up extremely quickly. Two poles less than two metres long for the front, and two more, thirty to forty centimetres long, for the back, are fixed firmly into the

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and Totamaddulù, the first a day's journey into the forest from Beric-Abdalù, the second two days from Labanar, and the others both near Togalanghe. 172

On both Great Andaman and Little Andaman the kitchen-middens yield a vast quantity of animal remains, bones and a great number of shells, with very little earth. The shells diminish in the upper levels, to be replaced by bones of *Sus andamanensis*, the wild pig of the islands, the change coinciding with the arrival of the dog in the islands; the revolution which this introduction brought into the life of the islanders is at once evident. [177]

My first excavations in 1931 were limited to establishing which mounds looked promising for future digs. I made soundings in the north, middle and south of Great Andaman and found that near each midden there were invariably abundant food supplies, as well as fresh water, sometimes running, sometimes in pools. The excavations went on for sixty days, aided by a first-class gang of men from Bihar, who even agreed, in view of the necessity of concentrated digging, to forgo their customary feast days. To these preliminary excavations I returned later on a number of occasions, using them as controls.

My first real dig began on 5 January 1932 in a fine midden on Middle Andaman, a few hours' march from the forest station of Long Island, at a place known as Beehive Hill, or Golpahar in Hindi. The water pipe installed for the benefit of the colonists on Long Island draws from a spring, and on its way to the reservoir on the shore it runs right through the centre of the midden. Emerging, it runs for a hundred and fifty metres through a mangrove swamp stinking with vile black mud, which in fact served as an excellent means of dating the layers, by relating them to the rise and fall in the ground level of the swamp over the last few thousands of years. 172 114

The whole of the time we were there we had to work with look-outs posted ready for any Jarawas trying an ambush; to the north of the midden the grave of a Burmese killed by them a short time before was a grim warning. We did a great deal of shooting, but fortunately only for game. Fallow deer descended from imported 114 136 ●

¹ With a number of young Indians very kindly allocated to my assistance by the anthropological service of the Government of India, and to all of whom I am greatly indebted for their enthusiastic help, often under the most trying conditions. [114]

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beasts were plentiful, and used to come right up to the camp out of curiosity, in spite of the noise of the shooting, and my men took so many that they were able to dry and smoke some for future use. There were flocks of pigeons after the fruit in the *Ficus* trees, and another rather smaller bird with green wings (*ariel* in Hindi). There were always large fish lying quietly on the surface of the sea, only two hundred metres from the dig, so that we could shoot these as well. The Jarawas were kept at bay, we all fed very well, and everyone was highly satisfied!

The camp was surrounded night and day by a chorus of frogs, and the lights of the camp attracted a whole army of hermit crabs; in the dry season they made an incredible noise parading up and down the dry leaves, even rummaging round our beds inside the tents while we were trying to get to sleep. They disappeared, suddenly and completely, immediately the rains came. Like the rest of their species they use their claws to close the shells in which they have made their home. Usually the large claw was able to do the job alone, but in case of difficulty they would bring the other claw and even their legs into the battle, until they managed to close the shell completely (my men enjoyed these struggles immensely). They in fact use various shells, and squeeze into them somehow, even into the cowries. Some varieties use nothing but cowries and their claws and legs have become very slender in adapting themselves to the narrow shell.

[126]

Unlike the hermit crabs, the rats were not affected by the seasons and came after our stores in hordes. I collected a number of species, but I was never able to catch one kind which particularly interested me. It was a jumping variety, graceful and rather larger than our mouse, with big ears, and a very pointed muzzle. The front feet were short, almost atrophied, and the back ones long, with strong, powerfully muscled haunches, so that the creature was rather like the rats of the pyramids in miniature. I often surprised them round my tent if I shone a torch suddenly, but they would bound away out of reach on their hind legs and no traps seemed to attract them. This variety does not seem to have been reported, at least in the Andamans, and it was the only one I was never able to catch.

When the rains came the disappearance of the hermit crabs was matched by the equally sudden appearance of curious cicadas, which chirped intermittently like all those in the Andamans. By the

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end of June 1953 there were legions of them. In contrast to the frogs, who were completely silent unless the atmosphere was calm, these cicadas only chirped when it was pouring with rain and blowing a gale, and then only at dawn and at dusk. Unlike other Asiatic species, they hopped from tree to tree between their momentary bursts of chirping, so that from minute to minute the chirping moved en bloc and made it almost impossible to catch them. When they were silent they were completely invisible against the branches, so that although we knew they were motionless we were still unable to catch them.

Surrounded by these diversions we began digging seriously. I must make it clear from the outset that in recording my findings I make no claim to saying the last word on the subject. All I hope to do is to report what I have been able to deduce from the combination of my personal observations of islanders as they are today and the evidence which I found in their kitchen-middens both of the past and of the present.

Though not as large as some I found later, the midden at Golpahar, like all the rest, was a truncated cone, beaten into a dome by the monsoons, and at the time of my excavation it was about five metres high with a circumference of a hundred and ten metres and a diameter of thirty-six metres. I removed half, leaving the other half so that others might later check my findings.

Ninety per cent of the contents proved to be shells, chiefly bivalves, and mainly *Cyrena*. As the shell content was clearly fairly constant I tried to calculate the total in the whole midden; and by taking into account the nomadic life of the present-day inhabitants of the island, and their eating habits, it was possible to reach a reasonable estimate of the age of the deposit.

Each midden can be regarded as attributable to the food refuse of groups of thirty to forty people, living at the site for forty to fifty days a year or less. Shellfish can never have been the islanders' sole diet. They are certainly not today - shellfish of any kind are only eaten when there is nothing else to be had, and then only in certain localities where it is not too much trouble to carry them to the camp. In other words, although shells formed the greater part of the deposit, they will only have been added to it sporadically. In the absence of some complete change of habits, unlikely in such cautious people as the Andamanese, we may deduce that the midden

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often extremely vicious but good hunters. The dogs often roam the forests in packs, hunting and devouring young pigs. The Onges will do nothing about it unless someone forces them to, but if this pack hunting is not stopped the pig will become extinct in ten or twenty years and in 1954 I tried myself (in vain) to draw the attention of the authorities to the situation.

The dog appears in even the most ancient of cultures in Australia, but did not spread to Tasmania, despite the geographical proximity. It arrived on Great Andaman with the establishment of the Indian penal colony and it is thus the Indian pariah which ultimately populated the whole archipelago. A despised outcast in India, the pariah became in the Andamans of enormous value, reverting to its ancient hunting instincts. Burmese police officials taught the islanders how to use the animal for hunting and within a few years it had revolutionized their methods. It led the islanders in fact, to comparative indolence; the dog worked for them, supplying with far less effort as much game as they used to catch in their long, weary and not always successful expeditions. Dogs meant invariable and abundant success in the hunt, and it is hardly surprising that the Andamanese came to develop a somewhat unbalanced affection for them.

On Little Andaman the dogs, with abundant food supplies always easily available, became physically far superior to their ancestors in India; unlike the pariahs they were well muscled, with good skins and coats, although most of them bear the marks of old and recent gashes by boar tusks.

On Great Andaman the dogs voluntarily catch and kill fallow deer. These, like the dogs, have increased to the extent of becoming a pest. The Arioto and Jarawas will not eat them for superstitious reasons, and so they have bred like wildfire, spreading to all the islands as far as Rutland. They swim well, but only with land in sight, and the greater distances involved have so far prevented them from spreading to Little Andaman.

Here the dogs have only one main prey - the pigs. Unlike the deer with their slender legs they cannot outdistance the dogs, and their only defence is to hide under the buttresses of the tree-trunks. The pig rushes underneath the tree, and faces the dogs like a stag at bay. There is no escape, only a few more terrible minutes of life. The pig fights the dogs off desperately, the males inflicting serious

CHAPTER FIVE

Harvest of Honey

The climate of the Andamans favours other things besides luxuriant vegetation. Myriads of insects and other tiny creatures are everywhere. The most important, and most dangerous for Europeans, are the mosquitoes, although the Andamanese are not worried by them. The most common is *Anopheles ludlowi*. These never move voluntarily more than a kilometre from their breeding ground, but the winds often carry them further afield. 136 ●

On Little Andaman I saw five different species of flies. Their larvae fed just as well on vegetable refuse as on meat. I remember throwing away on the shore north of Labanar a coconut from which I had drunk the milk; two days later I found the inner pulp, still soft, crawling with larvae, which later turned into flies very like our own. By contrast on another occasion I noticed that a beautiful green and yellow lobster weighing two kilograms which was thrown up on to the beach did not sustain larvae.

In various places round the shores of the Andamans the so-called sand-flies are a considerable nuisance, even in the day time and in full sun. Although only two millimetres long, the bite of these blood-thirsty insects causes unbearable irritation for some days. Even dousing oneself in Flit has no effect. If one goes into the darkness of the foliage to escape them, where it is damp, one is at once attacked by leeches. Only complete destruction of the vegetation would eradicate them and the ticks and this is unthinkable. The Onges with their bare plastered bodies are reasonably well protected, however, and the fleas also seem put off.

On Little Andaman I encountered too the ravages of bright yellow ants, diaphanous and so small one could hardly see them, which invaded our stores of provisions and my collections, despite

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- 136 every precaution. Holes so small that a hair would hardly pass through presented no obstacle to them and the metal boxes with tightly fitting lids, in which I kept my insect specimens, proved mouse- and rat-proof but not ant-proof, with disastrous results. Everything they found edible was reduced to dust. Sugar attracted them most of all; it was no use keeping it in screw-top containers, apparently foolproof, as they merely crawled up the thread of the lid and reduced the sugar to a mass of bodies. Large sheets of drawing paper left on top of a box for a fortnight were soon perforated by innumerable holes, through which they laid eggs, covering the sheets underneath. When I turned the top sheet over I found the eggs underneath, tended by myriads of adult ants, so small that a few puffs were enough to blow them off. On the ground all one could see were tiny dots - the eggs - apparently motionless; but almost immediately these all disappeared, borne away by the invisible workers. Not one egg was left behind. No other animal would have been able, if disturbed, to recover every one of its eggs like these ants and carry them off to safety; some sort of corporate organization among them seems to be proof against any threat of danger.

Another species which I saw around Labanar were the so-called red ants of the tropics, *Oecophylla smaragdina*. They were everywhere and I was able to observe them closely both in the day time and at night. I first made the acquaintance of these terrible but wonderful creatures on my first landing on Little Andaman on 20 February 1951, with Dr S. S. Sarkar. In the absence of any Onges, and not knowing anything of the enemies waiting among the leaves, we approached the foliage near the shore. In a flash vicious red ants whose nest we had kicked under the leaves forced us to the defensive. We escaped unharmed, but I was fascinated by them.

True to their popular name, they are red, but a very pale colour, verging on gold, although the species also includes some black specimens (the males) and some of a brilliant green (the queens). To see these one has to break the nest open; only the red warlike workers are normally visible. Their bodies, little more than one centimetre long, are borne on long, graceful legs, which are always in frenzied motion day and night. One only has to approach an isolated ant going about its work on the ground or on the leaves

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(or even worse, about the nest) and it will fly into absolute paroxysms of rage. I was much amused by the pugnacity of those apparently insignificant creatures. The ones nearest to the intruder always stretch forward as far as they can towards him on their middle and back legs, heads raised, their two front legs threshing the air feverishly, as though desperate to get at the invader at the earliest possible moment. They strain every nerve to reach forward and as they do so even lower parts of the abdomen reach over towards the enemy ready to sting. No matter how big he is they will attack, and their pygmy rage becomes quite comical. Once they have found bare flesh they bite madly, bringing their sting down viciously at the same time.

They can even distinguish between clothes and bare skin and will run about like lightning in search of a place to sting. They can cover a man completely from head to foot in a few seconds. The two phases of the attack, the straining of the body towards the enemy and the actual biting and stinging, are repeated frenziedly over and over again, the smell of blood seeming to whip them up to further rage. Nevertheless, I could not help thinking how graceful and elegant these fascinating creatures were and it would be well worth while returning to Little Andaman to film their life cycle and bellicose habits.

Oecophylla smaragdina belongs to a group of 'weaver' ants found particularly in the tropics of Asia and Oceania. These sew leaves together to build their nests; as they work only at night it is difficult to observe them, but they can be made to weave in the day time simply by making a hole in the nest. Repair begins immediately. They use a substance formed in the salivary glands of the larvae, which emerges like silk thread and hardens in contact with the air. In the day time, with the heat of the sun and the drier atmosphere hardening occurs too quickly, which is why they prefer to work at night: an outstanding example of adaptation to the necessities of the situation.

After a series of observations, I managed to reconstruct the process by which they work. When they went to join two leaves, they form gangs of seven or eight workers to draw selected leaves from a healthy plant together. The workers form a chain, one behind the other, each holding the one in front of him in his mandibles, with the rear ant clinging to one leaf and the front ant ready

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- 136 to grasp the edge of another leaf and draw it to him. A series of these chains, working side by side with their efforts synchronized, are strong enough to draw two leaves together, all the heads of the chains gripping one leaf in their jaws and the rear pairs of feet clinging with their tiny, sharp hooks on to the other. If the two leaves are growing close together, a single row of ants side by side is enough and they seem instinctively to know how many are needed.

Once the edges are together, the weaving squad can begin work. Each ant is armed with a larva gripped tightly in its jaws, moving it to and fro like a shuttle so that the fine thread of liquid emerges over the joint between leaves, hardening almost before it reaches them. And so the 'weaving' with the larvae 'shuttles' continues until in the end the two leaves are joined firmly, one party holding the leaves together while the other joins them with the silken web. This is repeated until enough leaves are joined together in a sphere to form the nest, any odd gaps remaining being sealed with further layers of thread.

The weaving is done only by the hordes of workers, who are completely sterile throughout their life (the single queen enclosed with a few males in each colony lays the eggs). The amazing thing is that there appear to be no leaders superintending the work, or deciding what must be done at any given moment. Yet the work proceeds smoothly and silently, with no interruptions, as though done by a single craftsman, each ant obeying while none commands.

- [342] Equally fascinating, and far more destructive, are the termites, whose life cycle and activities are the same all over the world. The Onges' communal huts, which would otherwise last for a considerable time, are constantly ravaged by them and reduced to dust under their onslaught. Their annual swarms are much the same on Little Andaman as elsewhere. Clouds of them rise out of the ground when the rains come and in mid-April every year I used to see myriads of them attracted by the lights of my camp on the north-east coast of the island. They would swarm round the camp, many landing on the table in front of me, while thousands more piled up on the ground below. The moment they landed they stopped dead, firmly planted on all six legs as though paralysed, and arched the lower part of their body up and over their back, touching their four wings one after the other with the tip of the abdomen. The

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wings suddenly dropped off along a predetermined line of fracture, 136
two to the left and two to the right. The whole process seemed to be
some instinctive reflex movement triggered off by coming to land
after the flight from their original hill. Then the termites began to
walk quickly as though they had never had wings.

The casting of their wings is the signal for the males to look for
the females. There follows a long nuptial 'march' culminating in
the union of queen and males, identical with what I had seen among
African termites, thousands of miles away.

Wherever they are, termites have a considerable effect on the
vegetation; some plants flourish with the constant upheaval of the
earth by the termites, while others cannot thrive in soil which is
constantly turned over. Termite hills may consequently be quite
bare of vegetation or covered with a dense jungle, according to
species and location. It is most unwise to disturb a termite hill. A
horde of defenders instantly assails the enemy, attacking him re-
morselessly with pincer-like jaws; if an attacking termite is pulled
off its prey, the abdomen comes off in one's fingers leaving the head
still attached to the victim, the jaws still biting viciously. Repair of
the damaged hill begins immediately it is disturbed, tightly packed
hordes of workers pouring out of the nest to the damaged area.
Somehow news of the disaster spreads like wildfire throughout the
hill, however large it may be, and like the red ants they obey im-
plicitly some unexpressed order, following an instinct the mech-
anism of which is still quite unexplained. [37]

The first impression of these hordes of repair workers is one
of utter confusion, but in the mass of termites bumping into each
other and apparently rushing about aimlessly each is motivated by
one thing only - the repair of the nest as quickly as possible. Since
termites need cover and darkness, this is done preferably with
earth brought from inside the nest; but if necessary gangs of
workers, chosen by some unknown mechanism from among the
milling hordes, come out into the baking sun, contrary to all their
instincts, and work from the outside, sacrificing themselves for the
community.

Much remains to be learnt of this weird compelling mechanism,
and I hope that others will be able to continue my observations in
the Andamans, where there are endless opportunities for the un-
interrupted study of these and other insects.

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136 In sharp contrast to the termites, with their highly developed social structure, is the solitary life of the fly-eating Hymenoptera. I saw one for the first time in my camp near Labanar. My Indian porters had put up a clothes-line and as soon as the washing had been taken down, the lines immediately became covered with flies; suddenly, as though attracted by the easy prey one of these insects appeared as if by magic. Half flying, half jumping, fluttering its wings very characteristically the whole time, it went from one end of the line to the other in pursuit of flies. Many of them managed to escape, only to alight again on the line and be chased a second time. In an instant they were seized and swallowed.

Smaller, but equally numerous, are various kinds of wasps, and their presence enabled me to continue some observations I had begun in Italy. Wasps look after their larvae very carefully, continuously putting food into the mouths of the dumpy, wiggling creatures. The larvae are in fact so voracious, continually thrusting their heads out of their cells for food, that they will accept food offered to them on the point of a needle, especially if the 'nurses' are removed from the nest.

Wasp larvae secrete silk like those of the red ants, but it is used only to seal the aperture of the cell in which the larvae grow. The sealing occurs spontaneously, in the day time or at night, at precisely the right stage of larval development, and takes about half an hour. The silk is ejected from the mouth, very fine and shining in the sun, and hardens almost immediately into a tiny white dome, closing the aperture of the cell. The larva inside then passes into the chrysalis stage and emerges as an adult wasp. To get out of the cell the young wasp attacks the centre of the seal with its mandibles, not just tearing it away, but actually eating it, so that its own silk becomes its first adult meal. Once emerged, it is at once ready to take its place in the work of tending new generations of larvae. It begins by passing the food brought into the nest by the workers to the young larvae, receiving the food in its mouth from the foragers and passing it to the next generation. And so the eternal cycle continues.

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262 Besides the wasps, two varieties of bee are found on Little Andaman, the larger, yellow *Apis dorsata* and the smaller brown *Apis nigrocincta*. The former, common in Central and Southern India and the Malaysian archipelago, builds large nests, hanging from the branches of trees. Its honey is the best, clear and golden, though

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less plentiful and containing a great deal of wax, and is greatly prized by the Onges. The darker bees, common in China, Celebes, Borneo and beyond, build their nests in cavities in the rocks, or in tree-trunks. Their honey, darker and with less wax, is more plentiful, but not so fine; when there is enough of the golden honey the Onges ignore the darker variety. 136 262

Few of the fruits on Little Andaman contain much sugar, but the Onges eat more than enough honey to compensate any deficiency that would otherwise occur. Whatever the fruit in season, men, women and children climb happily about like acrobats, hanging in the trees to get at it and the honey that goes with it. To chop the tree down is, of course, easiest and the obvious first choice for any Onge. Failing this, and their hooked poles, they climb up the nearby lianas into the branches, or walk up the trunk - an easy feat for them with their very long arms and almost prehensile toes. 222 [146]

Although there are arak nuts and betel leaves in the forest, the Onges ignore them. They are the same variety as elsewhere; *Areca catechu* and *Piper betel*. The Nicobarese are so addicted to them that many have lips and teeth hideously deformed as a result, but this is quite unknown among the Onges, contrary to earlier reports. The appearance of addiction in the Nicobars may have occurred after the separation of the peoples. 137 276 [171]

With all these fruits the Onges consume vast quantities of honey from the two species of bee, *dorsata* and *nigrocinta*. During the rainy season they can only get at the darker, poorer honey of *nigrocinta*, which builds nests under boulders or in crevices of trees or rocks. The Onges' real honey orgies occur, therefore, in the dry season, when the honey birds (*Indicationidae*), common in Africa and all over Asia, lead them to the trees where the golden honey of *dorsata* is hidden. 222 262 136

When one of the Onges finds a nest of bees he puts a mark on the rock or tree as a sign of ownership. None of the others would then dare to take possession of it, for fear of punishment by the group,¹ but when the time comes to take the honey everyone helps in the hard work of getting at the nest and opening it up. On one trip from Labanar to Togalanghe, on 19 March 1954, the Onges pointed out over twenty *Nigrocinta* nests to me, all reserved ready for use 222 423 [496]

¹ However deep in the forest a crime is committed, it will inevitably be discovered in the end, and punished by banishment from the community. [627]

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126 thought they were weeds and pulled them up. I never managed to see the plant in flower in the wild state, as this occurs at the height of the rainy season, and as no final definition is possible in the absence of the flower it remains unidentified.

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26 The Onges take full advantage of the plant's properties as a bee-deterrent and in mid-March they eat honey, paint themselves, and dance, twenty-four hours a day. During these orgies I have seen a group of about sixty Onges demolish in a few days ten pigs and a dozen large, wooden vessels full of honey, with basket after basket of fish, caught every night by the women, who were apparently not in the least tired by the long daily treks into the forest after the honey. I can never look back on the Onges without a feeling of profound respect for their powers of digestion!

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262 Yet another source of food for the islanders is the cicada. On Little Andaman there are a few species a little larger than the European variety and others rather smaller. The Onges collect the pupae as they emerge from the ground, usually in the mornings, and roast them as a great treat. They are actually very clean insects, which develop slowly under the earth over a period of years sucking lymph from the roots of the trees. When they emerge from the ground the pupae become leathery, but this presents no problem to the indomitable teeth of the Onges. Inside the cicada chrysalids are a mass of delicate tissues, so white and clean that one can understand the Onges' predilection for them.

825
136 On Little Andaman the cicadas chirp intermittently, with long silences; most of the day one hears nothing of them and when they suddenly start up the Onges fall absolutely quiet, terrified of frightening them away and losing their chrysalids.¹ In a few moments the whole forest suddenly echoes with a chorus of cicadas, as they all start up as one and then, a minute later, fall silent. Their intermittent chirping is not confined to the Andamans; it is a feature of several species throughout southern Asia. At Golpahar when I was in the middle of the forest excavating kitchen-middens I heard cicadas start up every day at 6.30 p.m., and then stop until the following day. In the mountains of South India, on the slopes

[114] ¹ The Onges do not seem to share the superstitions reported by Man and Brown among the Arioto, who appear to believe in fantastic connections between cicadas, the sun, and storms.

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of Pushpaghiri ('mountain of the flowers'), I saw workmen using the cicadas to mark the end of their shift, so regular were they in starting up. The whole valley echoed with their chirping for three minutes, and promptly at the signal everyone stopped work.

As well as cicada chrysalids, the Onges love the white larvae of the long-horned grasshoppers (Tettigonidae) which are common all over the island. They are the size of a man's finger and the larvae, like those of the cicadas, feed exclusively on vegetable matter and are very tasty. I have watched the Onges collecting them and managed to see something of the life cycle of the Longhorns. Both the larvae and the chrysalids live in cylindrical holes in trees, which the larvae bore out by eating at the wood. Before turning into a chrysalis the larva prepares the way out for the adult insect, which is less well adapted for gnawing. The chrysalids themselves seem determined to take up as little space as possible; as in all the Longhorns the future elytra are clearly visible on the creature's back, with the membranous wings, and the three pairs of legs are always curled up, with the first and second pairs very close to each other. The third pair is further away, clearly so as to balance the embryonic antennae. These are very long and spring from the sides of the head, passing down on either side of the thorax, between the first and second pairs of legs, to finish neatly coiled in front of the thorax, touching the elytra and the second pair of legs. Curled up like this into two or three coils, according to sex, the thread-like, whitish antennae look like intestinal worms inside the chrysalids. Each pair of legs lies motionless against the thorax, the feet touching in a precise line down the centre of the body. When the creature wakes from its long sleep, all the parts unfold, and the elytra and other external parts harden and colour according to the species. A new stage in the life cycle, shorter but more intense, has begun.

The Onges are not interested in the mole-cricket, but I found them fascinating. It is known that animals can find their nests or their usual haunts even if they are moved quite considerable distances away and deliberately confused, but the mechanism is not yet fully understood. It is likely that the same mechanism operates whether in the air, or on the ground, or below ground. The mole-cricket, for example digs long galleries underground and does not often come out into the open. The galleries are interconnected,

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136 enabling fair distances to be covered underground. It is not difficult to catch a mole-cricket, mark it, put it on the ground some distance away, and then recapture it in the original place. As it travels underground, sight can play no part in the mechanism, and in fact it burrows down as soon as it is put down on the ground. Its tunnels are not far down, and are easily damaged by heavy rain, animals or human feet, and so on. When this happens the insect closes the entrance to the damaged tunnel and digs a new one parallel to it, digging connecting galleries to the other tunnels, and it will do this, however many times the tunnel is damaged, as though determined to keep to the same line of direction.

Very different are the fireflies, which gave me a strange experience at the beginning of March 1953. I was with some Indians on a hunting expedition at low tide among the mangrove swamps near Berié-Abdalù on the east coast of Little Andaman. Night fell while we were still in the swamps, suddenly, as it always does in the tropics. There was a mist, and encouraged by the exceptional stillness of the air a shower of lights suddenly appeared all round us, twinkling in the air and on every leaf, as far as the eye could see, lit as if by magic. The effect was even more vivid than the phosphorescence of the sea that I had often admired. A confusion of strange sparks of light passed silently to and fro, and some of the city-bred Bengalis were terrified. To quieten them, I called them to a nearby plant, which was glowing like all the rest. As we approached we could see thousands of tiny specks of light moving endlessly to the edges of the leaves and branches and darting off into the air. I had seen fireflies before in a number of places but even so I could not take my eyes off these clouds of them, massed on every leaf and twig in sight.

The Onges, with their fear of the darkness, never see the fireflies in the mangrove swamps; but at certain times of the year there are millions of them round their camps and curiously enough the islanders attach no special significance to them. Every spring I spent in the island I saw fireflies, but not in large numbers. These were the males, which are winged, unlike the females. Once they reach the forest, they soar so high into the air that it is impossible to follow them, but the lights of the camp drew them down within sight. I never saw any females, easily distinguishable from the males as their light is continuous, whereas that of the males is

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intermittent. The constant flights of the males into the treetops made me think that the females were up there, but I was unable to confirm this. The fireflies will always remain for me one of the most attractive things about the forests of the Andamans. 136 ●

One could write whole books about all the insects and their nightly concerts. On the *Ficus* of Little Andaman live the caterpillars of a very beautiful moth *Antiberea paphia*, one of the Saturniidae; these are the silkworms which produce Tasar (or tusore) silk. On these trees they spin their silky cocoons, stronger than those of our European silkworms. Unlike the European *Saturnia pyri*, which leaves the plant before it goes into its cocoon, the Andaman variety remains on it. To avoid falling to the ground, the caterpillars always chew the leaves without weakening the edge to which they are clinging; one false nibble and they would plunge to the ground. As they enter the cocoon stage they take even greater precautions, crawling back to where the leaves join the stem and spinning a ring of silk in the joint. Then they run a thread down the dorsal vein of a leaf and attach the cocoon to it, so that even if the leaf is blown off by the gales the cocoon remains attached to the twig by its thread.

As the *Ficus* sheds its leaves in stages, and is therefore never entirely without leaves, the caterpillars appear twice a year, once in spring and once in the autumn. The butterflies from the first brood appear in mid-September and those from the second in mid-February, the only difference between the two broods, being the duration of the cocoon stage.

When it emerges from its cocoon the butterfly takes a few steps to the nearest support, where it spreads its wings to dry off. Then it sleeps for two days, waking in the night of the second day. As it sleeps the antennae, wire-like in the female, thicker in the male, lie flat against the head behind the eyes, becoming erect only as the butterfly wakes. The females are quiet and show no sign of flight, although they have large wings. The males, however, are restless, and keep circling, mating on their first flight. The females are usually fertilized and die as soon as they have laid their eggs on the plant where they were born. Virgin females which I kept in a case [26] attracted males from many kilometres away, as with our *Saturnia pyri*. The males know unhesitatingly which are the virgin females, although it is not known how they do so.

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● 136 For the greater part of the year crickets and frogs fill the nights with wave after wave of placid, homely sound, tenor and baritone in full and solemn chorus. Within one area of a few kilometres there are more crickets than the entire human population of the world. Only the males chirp; the females are silent. The song may be for the purpose of attracting the females, but I rather doubt this, for they sing not only before, but also during and after mating. Alone or in chorus crickets will always sing, right up to the moment of death.

The general rule in all the various species of cricket which I have collected in various parts of the world is that only the males chirp. Very rarely both males and females sing; in other rare cases, neither sex sings. However great the physical variations between the species, their mating habits vary very little.

In the Andamans, however, the noise even of the crickets is drowned by the amphibia, particularly the green frogs. Like the crickets, they never sing alone, but always in chorus, led by those with the loudest voice. At fairly regular intervals a few odd frogs will start up; sometimes the chorus is lost, but only for a short while, and then it returns in full force, drowning the individual singers. Is this their collective homage to the fair sex, the females choosing the champions who lead the choir? I do not myself consider this a satisfactory explanation; in the Andamans at least the females normally behave as though the singing does not exist, even while the males work themselves up into a frenzy of croaking.

126 I managed to collect fairly large numbers of all these vocal
136 creatures, particularly the insects, for the Institute of Zoology of the University of Naples, and it appears that all are known species common in the neighbouring islands and land masses. Insects are easily spread by the wind over considerable areas if they are caught up in an air current while in flight; I remember one October in the Gulf of Guinea, over three hundred miles from the nearest land, I caught considerable numbers of large insects, blown towards the ship by the wind and attracted by the lights. Borne by the monsoon winds, the insects of southern Asia and Indonesia must have drifted across to the Andamans long ago and flourished in the lush forests.

136 Needless to say, the abundance of insect life on the Andamans makes the archipelago a birds' paradise. Like the insects on which they live their song echoes through the forests day and night, to

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the background rhythm of the woodpeckers tapping on the trunks. I knew that they did this when seeking food, but it was the Onges, natural observers of wild life, who convinced me that the tapping could sometimes be unconnected with foraging. Wherever I camped there were always large trees nearby and with the aid of field glasses it was a simple matter to keep an eye on the woodpeckers, which varied in size from some smaller than our sparrows to others, brilliantly coloured and bigger than pigeons. 136

One persistent tapper on Little Andaman is a beautiful black woodpecker with a bright red tuft on its head, *Dryocopus martius*, also found in Asia and parts of Europe. I captured some that were thirty-five centimetres long, bigger than any of the other local species. Another, equally common, was slightly smaller than our blackbird and a glorious chestnut colour all over. A little black and white one was even more numerous. I often saw a variety of *Dendrocopus major*, with black and white body, red tuft on the head and a striking crimson feather under the tail. Others were mainly green, always with the red tuft on the head. [126]

All of them hammer on the tree-trunks with their beaks and it is not fully understood why they do so. Tapping in search of insects can be heard the year round and the sound is similar to that made when the nest is being hollowed out. The other form of tapping, true drumming in the musical sense of the word, is only heard in the mating season and is infinitely louder. The Onges connect this sound with reproduction, although they have not grasped the connection between mating and birth. It can be heard over three hundred metres away, while the tapping for food or nest-building carries only for a short distance. [825]

When the bird is breaking through the bark in search of food or hollowing out the nest, the beak usually strikes the trunk at an angle and at irregular intervals. The bird throws its whole strength into each blow, lifting its head right back every time to strike even harder with the next blow. The blows are usually struck first from the right, three or four in quick succession, and then three or four from the left, to dislodge a chip of bark or wood. When the woodpecker nears the larva he is after, still hidden under the bark, the blows may become perpendicular. In nest-building a hollow is cut out of wood, often seven or eight centimetres deep in the case of the larger species, and large enough in diameter to admit the bird. Then

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- 136 the hole is enlarged downwards, still the same width, for thirty centimetres or so, to end in an oval cavity large enough to take the incubating female. In both cases all the tapping is done while the bird clings on to the trunk with its claws, which have reversible digits; it is balanced by the tail with its hard, bristle-tipped feathers.

The musical drumming during the mating season is rhythmic, and less violent. The bird selects a hollow trunk and will return to the same one for months. The beak strikes at the rate of about seven to ten blows per second and always in one place, so that no bark is chipped out. The sound diminishes in intensity from the first blow to the last, unlike the food- or nest-drumming. Like the cicada the bird uses its own body as a sound box to aid reverberation, filling itself with as much air as possible. As part of the flight mechanism, all birds have air cavities connected to their lungs and in the woodpecker the system is extremely well developed. These cavities help to increase the vibrations made by drumming on the wood. The head is held at the right angle to obtain the best reverberation (not the best angle for chipping out bark, as when the bird is looking for food), and the bird itself vibrates with the wood, absorbing the short sound-waves and increasing the resonance.

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[261] Although to the naturalist there is enough in the wild life of the Andamans for endless studies of everything from cuckoos to parrots, sea snakes, shells with their beautiful spiral patterns – and the wealth of material almost overwhelms one – it must be admitted that the Onges see all the beauty around them mainly in terms of food.

136 They will search for hours for the nests of the salangana or *Collocalia esculenta*, the swallow which builds well-known edible nests so greatly prized in many parts of the world. The bird secretes a gummy saliva, which hardens when exposed to the air, and it is of this that it builds its nest in caves near the sea, ejecting saliva on to the roof of the caves. The substance acts in Man as an aphrodisiac, which may account for the value placed upon swallows' nests in China. The nests are found usually in the darkest parts of the caves, hanging from the roof, sometimes seven or eight in a bunch. It is not known why these swallows like to nest in the dark, or how they manage to find their own eggs and young when they return to the cave after foraging, or are driven away from the nest by intruders such as snakes. It seems on the face of it impossible for snakes to

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climb up the roof of the cave, but they do. I collected a number, all *Trimesurus viridis*, and now in the Institute of Zoology of the University of Genoa. I had to pull them off the roof by the tail, as they were stuck fast on the rough surface of the rock. The snakes devour both eggs and young of the swallows, but the parents invariably return to the right nest, even if the contents are gone. When disturbed the salangana, tiny insect-eating birds with very long wings, fly in a tight flock towards the mouth of the cave, where they can be easily knocked down or trapped.

Below the nests there is always a thick layer of guano, crawling with insects and built up over the centuries by generations of birds using the same nesting places. The nests, about five to six centimetres in diameter and very small inside, normally contain one egg, rarely two or three. When we detached the nests from the roof, the young, instead of trying to escape, clung fast to the nest with their claws, cowering in the bottom and staring at us.

To several nests with only one egg, I added another. When I returned a few days later I found the interloper being happily cared for by the foster parents, showing that as is usually the case the parent birds recognize only the nest and accept the contents of it without question. Outside the nest, however, they fail to recognize even their own offspring, and in carnivorous species may even eat them. The young of the salangana are tended by the parent birds for only a few days after hatching, and as soon as they begin to move about outside the nest all recognition is permanently lost.

It is somewhat surprising that the bird populations of the Andamans differ considerably from island to island. The establishment of such marked, almost specific differences as are now apparent between birds clearly originally of the same species must have taken a very long time indeed and can only be explained if one assumes – justifiably, from my observations – that many species roam less widely than one would expect. The pigeon of Little Andaman (*unugbé* to the Onges) is surprisingly sedentary, so that varieties in the various islands have developed as isolates and differ considerably. That of South Andaman, for example, is smaller than that found on Little Andaman, while those of Car Nicobar are larger still. And in a particular area fifteen kilometres west of Port Blair I repeatedly caught pigeons which were absolutely emaciated with their intestines loaded with tapeworms, whereas outside this

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● 136 restricted area I never found one. Another pigeon, all white apart from the wings and tail, on the other hand, migrates regularly as far as Sumatra and Java, yet still fails to produce local species.

On the whole, there is considerable zoological and botanical uniformity between the two hundred and four islands in the archipelago, even the furthest apart. One striking feature is the complete absence of native large mammals and of any traces of such in the geological past. There are, for example, no felines except *Paradoxurus*, the jungle cat, rather smaller than the domestic cat, which lives along the coasts. It prefers marine prey and roams the beaches at night after fish and crustacea, leaving a long trail of footprints. Sometimes it will kill lobsters larger than itself, and in the morning one sees the remains that the sea has not washed away or the rats gnawed. This is significant, as the jungle cat and rats were clearly the only mammals on Little Andaman until the recent deliberate introductions, and it is interesting that the cat incidentally feeds and helps to perpetuate the rats on which it preys. Both, unlike the great mammals, have survived the gradual restrictions of area imposed by the continual fragmentation of the archipelago, by virtue of their greater adaptability to 'marine' existence. So, too, have the reptiles and amphibia managed to survive - all closely related to the species found on the land mass of which the Andamans were originally part.

In the case of amphibia many species have been cut off in the archipelago perhaps for thousands of years, and yet have nearly all remained identical with those of the continents from which they came. One example is *Bufo melanostictus*, the common toad of Asia. I found them the same on Great and Little Andaman as in Bengal, Assam, Ceylon and other parts of Asia, and unlike the birds there is no difference between the toad populations of the various islands.

The same is true of the reptiles except that the same species, in Asia highly poisonous, often lethal within an hour, are somewhat less poisonous in the Andamans, although they can still cause severe discomfort.

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133 to six metres or more, with sudden vertical drops and dangerous overhangs. It is here, however, that underwater life is at its most beautiful. Swarms of fish, painted in fantastic variegated stripes, spots and patches in imitation of their surroundings, live among these caverns, rushing about in the wells of deep water. When they are pursued by bigger fish, the shoals will leap suddenly out of the water, only to be caught by the gulls who are always lying in wait for them. I have watched the shoals from the shore, and seen them leap out of the sea to lie gasping on the sand, dying quickly in the heat.

136 Where there are channels in direct communication with the open sea, small sharks slightly over a metre in length move in to meet any swimmers, though a clap of the hands is enough to put them to flight. Fish weighing several kilograms hide in the recesses of the rocks bordering the corals, but they quickly emerge if poked with a stick, and the Onge women have an ingenious system of catching them. Rocks sticking up out of the water swarm with crustacea and tiny molluscs. Apart from the crabs, I was struck by their poor relations, the hermit crabs, comical tenants of all kinds of shells. One species, common in Little Andaman but rare on Great Andaman, is a beautiful tomato red all over, while others are bluish or grey.

[22] The underwater world round the islands is completed by large numbers of several *Holothuria*, lazy, but conspicuous, and the huge bivalve mollusc, *Tridacna* or Giant Clam. Some of these are anything up to a hundred years old and well over a metre in diameter, and weigh between two and three hundredweight. Always open, and incapable of moving from place to place, they feed by means of a multicoloured 'fringe' attached to the hem of each shell, the beating cilia which wave unceasingly causing eddies in the surrounding water and so drawing in plankton from a wide radius. Under normally calm conditions, this process of drawing in and swallowing plankton goes on without stopping, day and night. The huge molluscs look like simple baskets of blue, red, green and white flowers set on the sea bed, but they are in fact terrible creatures. If a man's hand or a foot should be sucked into the quite strong eddy the 'fringe' of cilia immediately folds back and the *Tridacna* suddenly closes like a giant eye silently, viciously, and so violently as to crush completely the limb caught between the two

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valves as they close. The strength of *Tridacna* is terrifying; an Onge 136 friend of mine lost all the toes of his right foot when he inadvertently touched a *Tridacna* while swimming under water, and they have even been known to cut a man in half. Unfortunately, the creatures do not require a great depth of water and are found a few metres from the surface, even in the highest tides, so that they are a real danger.

To describe the underwater life of the Andamans in detail would itself fill a book. The shells alone, monovalves and bivalves alike, are of innumerable kinds and would arouse the enthusiasm of any collector. Various kinds of elegant and brilliantly coloured cowries are everywhere, moving about slowly at the water's edge. In a few hours one can gather sackfuls of all kinds of perfect shells, each one more beautiful than the last.

Pterocera of various species abound among the reefs. They are always small, seldom reaching thirty centimetres including the strange finger-like protuberances which give them their name of 'finger-shells'. They are always drab and inconspicuous from above, but the inside of the shell is a beautiful coral red. But they are always easy to pick out because of their protuberances.

I myself learned a sharp lesson from a finger-shell. I had always wondered why the shell had so many of these apparently useless protuberances, and one taught me how wrong I was: these 'fingers' perform a vital function in the search for food. The finger-shell has a strong muscular foot, with which it closes its shell when it retreats inside. When the opening is closed, only the outer surface of the foot can be seen, like an operculum, brown and horny. The secret of the protuberances lies in their combined action with the propulsive power of the foot: this is capable of throwing the creature with great rapidity in any direction, but usually sideways. Once it has noticed an open bivalve, usually one of the many local pinnae, about thirty centimetres long, the *Pterocera* approaches cautiously and with a sudden rush thrusts one or two of its protuberances, usually the lateral ones, deeply into the aperture of the pinna. Once impaled, the bivalve, normally ready to barricade itself in its shell at the slightest touch, remains at the mercy of the *Pterocera*. The latter calmly prises open the blocked aperture, gradually inserting its prong deeper and deeper, and consumes the tender flesh of its helpless victim. (Another gastropod, *Murex*

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● 136 *fortispine*, uses a similar action on the larger bivalves. Its shell is equipped with a very effective form of tin-opener, which it keeps polished by vigorous rubbing.)

I watched a *Pterocera* attentively scrutinizing the hand holding it. After exploring it very carefully, the creature tried to free itself by beating violently with its foot, causing considerable pain. I held one by one of its protuberances, which was like a large right-angled hook. Suddenly, while my attention was held by a shoal of fish, I felt a sharp pain on the back of my hand. Taken by surprise, I watched the creature to try and discover what it had done. From a furrow at the base of one large front hook, a little to its left, I saw a tentacle emerge, able to turn in any direction, with a retractable eye at its tip. The eye, after a few exploratory movements, fixed its gaze on the place on my hand the creature intended to hit, and then the foot began to beat wildly on my hand, time and time again, causing a quite surprising degree of pain.

462 It is during the honey feasts, when the tides are exceptionally low
226 and the seas calm, that the womenfolk come into prominence.
224 While the men normally do all the hunting for game and large fish, using arrows and harpoons, the women, with their nets, catch the smaller fish in the rivers and marshes, and among the coral reefs at low tide. Their contribution to the everyday diet is by no means negligible, and during the season of very low tides their daily haul is tremendous.

262 The importance of fish to the Onges is shown by the fact that
825 their word for it, *ciogbe*, is also used to mean food in general, and clearly dates back to the time before the arrival of the pigs on the island, when fish and sea food in general was the basis of their diet.

[251] So plentiful is it that even at the height of the season the most they do in the way of preserving anything for future use is to expose the fish to smoke in order to deter flies from laying eggs on it for a day or two.

462 Only on very rare occasions do the men help in the net-fishing,
226 and then only when they can completely fill the canoes with fish very quickly. I saw it happen for the first time on 24 March 1953, in the great coral reef near Nachuge, just as it happens all over the island at this time of year, when the pilchard shoals are so far in-shore that there are not enough canoes to hold the catch. As the

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tide goes down, the shoals are caught in the reefs stretching out to sea all round the island and the Onges leave everything to man-handle the canoes from pool to pool and fill them to overflowing. The water is almost saturated with fish, and the Onges go on and on until they have nothing more they can use to hold the catch. Nowhere else in the world have I seen anything like this wholesale slaughter.

The pilchards of the Andamans are rather larger than usual, some weighing as much as half a kilogram or more. The Onges catch them regardless of size and then sort them into lengths before cooking (cooking, needless to say, without stopping to gut them). Men, women and children work feverishly, plunging their hands into the heaving mass of fish so that they reek of it for days, together with the dogs, whose coats become the inevitable hand-towels.

Every available vessel is used for the cooking, and the rest of the haul is cooked directly over hot ashes. The biggest are cooked alone; the smaller ones, in batches of half to one kilogram, are wrapped in big fleshy leaves, tied up with vegetable fibres and cooked for ten minutes or so, turned regularly all the while. To boil the fish, an entire netful of fish roughly equal in size is plunged into boiling water, and boiled as usual far too long for our taste.

Everyone cooks and eats at the same time until (temporarily) unable to eat any more, when the rest of the haul is laid on improvised racks with fires of green wood making smoke underneath. When, a few days later, all is gone, fishing begins again. And so life goes on for weeks, until the shoals have passed the islands.

The real fishing, however, is done by the men. The women use small nets about fifty centimetres in diameter, and about the same depth. The opening consists of a pliable cane, barely three centimetres in diameter, bent into a circle and tied with the ends crossing each other and projecting about twenty centimetres to form the handles. Each woman handles two nets, one held between the legs and the other in one hand, while the other hand pokes with a stick into the crevices in the reefs under the water to drive out the fish which have taken refuge as the tide goes out. Once found the fish are killed - very simply, by biting them between the

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126 build it (when I wanted to acquire two for the new anthropological museum at Port Blair and the Indian Museum in Calcutta I had to bargain with the men recognized as the owners, although the price had to be distributed among all the members of the group).

225 The chief delight of the men on their fishing trips is the capture of a
252 Giant Turtle. I have already described (p. 88) the spear harpoons which the Onges use to catch them. Once caught, the wretched animals are subjected to a form of vivisection utterly incomprehensible to the Western mind; they are literally cut up alive and the pieces thrown into the boiling cooking-pot. Nor have I ever witnessed anything so terrible as the way in which the Onges, in the absence of any suitable cooking vessel, or the materials for an earth oven, roast these turtles whole and alive over a slow fire.
[157] They seem totally unable to realize that animals can feel pain and laugh like children at the other atrocious tortures they unwittingly inflict not only on the turtles, but on every living thing that falls into their hands.

825 These marine turtles (as far as I was able to see there were no land
262 turtles in the Andamans) yield a far greater amount of food than the dugong, and provide the islanders with both meat and eggs. Two
[136] species are common in the seas round the islands, *Chelonia virgata*, or the green turtle, and *Caretta imbricata*, which supplies the shells normally sold commercially. The Onges prefer the former, which are both meaty and more plentiful.

722 Turtle-hunting and egg-collecting is done by the menfolk. The
225 method is very like that used for dugong and large fish, using the
467 harpoon. Owing to their fear of the spirits abroad in the night, the
[176] Onges never go near the beaches between dusk and dawn, when it would be easy to take the turtles on land and immobilize them by turning them on their backs. They do know this trick, however, and use it when captured turtles (often weighing up to a hundredweight) are too heavy to carry in the canoe; the animals are turned on their backs and dumped on the beach ready to pick up later.

225 The Onges harpoon the turtles from canoes, preferably at night when the turtles are nearing the shore, which they never approach in the day time. When there is a moon the creatures are easily seen, and on dark nights the phosphorescence of the sea helps.

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225 turning the turtle over on its back as soon as it is landed, and then blinding the wretched creature by putting both eyes out with a sharp stick, so that it cannot escape even if it manages to right itself.

222 Turtle eggs are easy to find. Before laying them in the sand about one metre deep, the turtle makes several visits about a fortnight beforehand to choose the spot. The huge footprints she leaves in the sand are easily seen, and watch is kept on the spot. When the Onges know roughly where to look they know that by poking in the sand with a stick they must in the end find the eggs. As one man, and happy as sandboys, they dig in the sand, lower and lower, till the sight of the first egg is greeted with a shout of triumph. One by one the eggs emerge to fill the baskets, hastily improvised and lined with great leaves.

The female may actually be seen depositing the eggs, up to two hundred at a time. Some will be infertile, and are smaller, with no yolk, but normally they are the size and shape of a billiard ball, deposited one after another at the rate of ten a minute. As they are laid a viscous secretion flows over them so that the sand sticks to them. As it dries, however, the sand can be rubbed off the shells, which are not rigid and resemble a shining white parchment; on each egg is a tiny round indentation, which increases in size within two or three days and makes the egg look as though it has shrivelled in the sun. In fact, the eggs will not hatch unless they remain buried deep in the sand.

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222 Not more than half the turtle eggs laid in the Andamans hatch out into young turtles, so eager for them are man and beast alike. Man is their worst enemy, and it is no exaggeration to say that no clutch laid on Little Andaman has any hope of hatching. Man and animals alike range the beaches in search of the delicacy. First come the pigs, so greedy that if they come upon a female in the act of laying they give her no time even to cover the eggs. Then come the monitors, voracious lizards two metres long, and on the east coast near Nachuge, huge crocodiles as well. Finally, *Paradoxurus*, the wild cat of the Andamans, takes anything that is left.

136 The Onges have to compete with all these for turtle eggs, and they are nearly always too late. They have to look instead to the deserted islands, like the nearby South and North Brother. Here the young turtles have some chance of hatching, but as soon as they

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emerge from the eggs and make their way towards the sea, led by 136
some unerring instinct, fresh predators are ready to pounce on
them. Hungry gulls and fish, and the giant crabs, lie in wait and
sometimes not one escapes.

But the annual survival of only ten young from each female
would be enough to allay any fears for the extinction of the species
and fortunately reproduction takes place several times a year, often
four or five times, according to the Onges, mainly from March to
September.

In the case of eggs which I protected and watched, incubation 136
lasted sixty to seventy days depending on the time of year. During 262
the whole of the incubation period the Onges regard them as
edible, like the Bushmen of the Kalahari, whom I saw take and eat
birds' eggs regardless of their age or state of development. The
Onges even like the turtle embryos when cooked, and the other
contents of the shell. Curiously enough, however long they are
cooked the whites of turtle eggs never set, although the yolk does
and is excellent. The Onges, as a sign of great respect, often gave [23]
me baskets full of the hard-boiled yolks.

Turtles, despite their peaceable appearance, are extremely aggres- 136
sive, and will take on nearly anything they meet. Their battles are
one of the most amusing things in the animal world. The males of
the marine turtles rarely approach the shore, except to fight each
other. This they do ferociously, biting at everything within reach;
regardless of being bitten themselves, as the land turtles do in the
mating season. The aim is to overturn one's enemy so that he is
quite helpless, after which the winner ambles off, leaving the van-
quished to his own devices (the trick is to get one's head under one's
opponent's body and lever upwards). A turtle, once on its back,
takes hours to right itself, which it can only do by accident, when
its frantic wriggling and beating in the air with its legs hollows
the sand away underneath its back so that it flops over the right
way up.

One of the Onges' greatest enemies in their search for food is the
crocodile, *teboirona*, as they call it. They have no means of fighting [25]
the creature, so they limit themselves to fearing it and building
stories round it. On Little Andaman crocodiles are found only near
Nachuge on the west coast, in the deep waters of Jackson Creek,
To-ggw. There used to be numbers of them in a few places on Great

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- 136 Andaman, in Yeratil Jig (near Port Anson, about fifteen miles from Long Island) in Diglipur (or Dilyapur) Creek, near Port Cornwallis, and in Wilima Jig,¹ but they are now extinct. In March 1952 the Onges had described the presence of crocodiles so clearly to me as to leave no doubt what they meant, and I soon received confirmation when I found their tracks on the sand about one kilometre from the mouth of Jackson Creek, on the right bank, and then saw some lying on the shore across the creek. Through my field glasses I saw small birds pecking between the teeth of the great wide-open jaws. As we approached they slid lazily into the sea, some re-appearing a little later, their cavernous mouths rising vertically out of the water. Every day after that I saw them swimming quietly near the banks, and one afternoon my men and I between us saw over a dozen, near Nachuge, dozing in the mud or in the water.

[825]
[198] The Onges assured me that crocodiles will come out of the water to a certain whistle. I got them to try it; the Onges whistled, and whistled again, but no crocodiles came!

237 Very different from the great turtles and the crocodiles, but
321 equally important in the daily life of the Onges, are the crabs from
276 which the islanders make their ancient and very characteristic pipes.
172 They eat the crabs and use the claws to make the pipes, cutting them across the joint and boring a hole in the end, as they have done since time immemorial, to smoke aromatic leaves from the forest. Fragments of similar pipes, charred with use, appear in even the lowest strata of the kitchen-middens, dating back thousands of years and proving the antiquity of the smoking habit. Contrary to popular belief, smoking did not begin everywhere with the introduction of tobacco - in Asia at least men smoked thousands of years ago.

237 The claw pipes of the Onges have a groove cut round the end
276 which goes into the mouth, so that the teeth can grip it better. I
171 have seen identical pipes, with the same groove, in the Melville Islands, where there are many other signs of ethnographic connections with the Andamans. The canoes, for example, are identical with those of the Andamans; the peoples themselves, however, are today very different physically.

[501]
[142] ¹ According to Portman a man was dragged into the water here on 11 May 1894 by a crocodile and killed; several similar incidents have occurred since.

[165]

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These crabs are enormous, weighing one and a half kilograms, and are very tasty. Like many land crabs they have one large claw and a smaller one, the difference being quite marked in the males, though hardly noticeable in females. Some appear left-handed, some right-handed; I confirmed this by looking at thousands of them with the help of my Indians, and sent some to the Institute of Zoology at the University of Genoa for further examination. 136 ●

On the inside of the large claw, to hold the prey while the crab bites, are protuberances that look like teeth. They have a very similar function and are a good example of superficial similarity in different types of organs designed for a similar purpose. [126]

The females, like those of other crabs, carry the mass of round, almost transparent, orange-coloured eggs under the abdomen, attached to her swimmerets and well protected. In the great crabs from which the Onges make their pipes the bluish-green shell is reflected on to the eggs, giving them a beautiful sheen. Immediately the young are hatched, they cling underneath the mother's abdomen like the eggs, so that if a female is caught one can be sure of having the whole brood. Even at this stage the sex and the disparity of the claws is discernible as the young are exact replicas of the adults. Two curious things about them are that the number of the two sexes in any brood are exactly equal, and that in the males there are equal numbers right- and left-handed. The point is an interesting one, and I hope geneticists will be able to investigate it further.

Another important feature in Onge life is the *Nautilus*, the cephalopod whose shells provide the only drinking vessels they know. *Nautilus* shells, unlike those of gastropods, are spiral in one plane, with interocular septa. The mollusc occupies the last, or largest, of the whorls, which communicates with the rest of the spiral by a cylindrical syphon running through the mid-line of the shell. This is connected to the creature's viscera by a vascular tube, which for hydrostatic purposes regulates the amount of air and water in the chambers. Each chamber is concave on the side nearest the aperture, and the distance between the septa increases with the size of the whorls, to a fixed maximum, limited by their number, which is constant in adults. *Nautilus*, a living fossil from the time of the ammonites, is the last survivor of a genus dating from the Silurian period; long ago there were many species, although only four have [237]
[415]

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- 136 been found since 1500. It is found only in the seas round Australia and Malaysia, flourishing round the Andamans, growing rarer towards Indonesia, and reaching as far as the Philippines.

Although *Nautilus* shells are very often thrown up by the sea on the shores of Little Andaman (though rarely whole, because they are so fragile), I never managed to find one alive. The creature prefers to live below thirty metres, where it can be taken with a hook and line. I distributed some to the Onges and offered them every possible inducement, but no one managed to catch a live *Nautilus*. The lovely shells are striped white and rosy pink on top, shading to a mother of pearl colour underneath, and when polished and shaped make beautiful cups or ornaments. I brought some back to Italy with me, but the best were stolen. In one collection in the Zoological Museum of the University of Florence there are some fine ones set in silver, now of considerable value.

- 237 Another shell which the Onges use is that of the huge bivalve
302 *Tridacna*, the elephant of the mollusc world (see p. 114). For
123 many hundreds of years they have filled these shells with water and
177 used them as mirrors when they paint themselves. (The reflection is poor, however, and they fell enthusiastically on the mirrors I had taken with me. These they named *quistanga*, derived from their name for *Tridacna*, and followed me all over the island to get them.)

- 136 Two species of *Tridacna* are found on Little Andaman; *Tridacna*
262 *gigas*, the larger, and *Tridacna squamosa*, large, but somewhat lighter in weight. Both live in relatively shallow water and are equally terrifying once they have got a hold (see p. 114). Fortunately, the Onges have learnt to surprise them when they are open and slash the single immensely powerful muscle, which closes the two halves of the shell. The flesh is edible when well boiled, and certain parts can even be quite tasty, with a delicate sea flavour; I even ate some raw, much to the horror of the Onges. (They were equally scandalized at my eating raw some of the excellent oysters, which they despise.)

- 136 Some of the *Tridacna* of the Andamans and Nicobar can weigh over two and a half hundredweights. The actual flesh is not heavy - the two halves of a magnificent *T. squamosa* that I caught at Nancowry in the Nicobars and gave to the Governor of the Andamans weighed nearly one and a half hundredweights and were over 1.3

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metres in diameter. They are now used for the holy water in the new church of San Piero in Palco, in Florence, like those in the church of St Sulpice in Paris. Two valves of *T. gigas*, rather smaller, are being used for the same purpose in the church of Marco Polo in Viareggio. 136

Among the creatures the Onges hunt on the shores are crayfish, which can be taken in plenty in the streams of Little Andaman, although I found none on Great Andaman or in the Nicobars. As they were so common I assumed they were a known species and did not bother to collect any. In Madras, however, an expert on freshwater crustacea, Sri Sada Siva, told me that this appeared to be a new species and it would be well worth while returning to Little Andaman to collect further specimens, as the few I had brought are now lost. There are tens of thousands of them everywhere. [222]

These freshwater crayfish are so tasty that they have entered into Onge folklore, and their tastiness is praised in song. They are baked on burning embers, without salt, as always, and just the charred shell is removed before they are eaten. The clean fresh water in which they live prevents any taint in the flavour. I must confess to having eaten them every day without realizing their importance as a possible new species. They are fairly large, about fifteen centimetres long, and almost black, in natural imitation of the dark rocks among which they try to vanish out of sight, although the Onges never fail to spot them. The males have slender pereiopods, with claws almost twice as long as the whole body; these the creatures thrust out before them, and so slender are they that it is difficult to catch a male with both pereiopods intact. After hatching, the young, which are identical with the adults as soon as they hatch and can therefore be sexed by the presence and absence of pereiopods, cling bunched together for several weeks, attached by their claws to their mother's swimmerets before making their way into the troubled waters of the rivers, where the great carp are waiting to prey on them. [262] [538] [252]

Yet another freshwater creature eagerly sought by the Onges is one that is almost black in colour, a strange survival of some remote geological era. Like other members of the family it has no scales, and the mouth, armed with teeth, is not protractile. On Little Andaman I saw several specimens weighing over a kilogram, and

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136 many smaller ones, all good to eat. Near my base camp at Lahonar,
 [222] the men caught sackfuls of them, and I found young ones near the communal hut at Togalanghe.

There a rocky path winds down to the banks of the river Tciongarè (or Chongaree) to the south of the camp. In various places, where the path levels out, black muddy water collects into pools full of rotting leaves, lying on a bed of ooze and slime. In these pools, which appear and dry up again very quickly, I was surprised to catch a number of *silurides*. When it rains heavily, however, the pools link and join up with the river where the fish live, so that as the water disappears again any fish which have entered the pools are prevented from returning to the river, and are left lying in the slime as the water evaporates. These *silurides* have no gills, and are equipped instead with nostrils of an unusual type; from the nostrils protrude two cylindrical tubes, half a centimetre long in fish fifteen centimetres long, the same blackish colour as the rest of the body. The tail and the long dorsal fin are yellowish, and the long ventral fin running from the anus to the tail is whitish. There are two large lateral pectoral fins, with two very small ones between them. The eyes are large, starting out of the head like tiny glass domes. Very unfortunately a number of specimens which I had most carefully preserved were lost in transit from Port Blair to Calcutta, when some of my baggage, including the crabs and a collection of face masks of Nicobarese which had cost me a great deal of trouble, mysteriously disappeared *en route*.

136 The Onges do not eat eels,¹ which they regard as snakes, but they
 262 several times brought me examples of a very fine freshwater eel
 226 whose presence on Little Andaman I had not suspected. The Onges caught them, as they do all fish, with their bows and arrows. All weighed over half a kilogram and looked and tasted like European eels.

136 The eel of the Andamans, like those of Europe and America, has a long, almost cylindrical body and a single fin which begins on the back, circles the tail, and ends under the body just in front of the anus. There is also a pair of strong pectoral fins. The head distinguishes it from other eels, its rounded snout and wide mouth being

[184] ¹ The Arioto, however, eat eels, and also mice and other small animals, although food is given to them by the Governor in return for police duties. Brown also refers to the eating of snakes and mice on Great Andaman.

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rather shorter than in other species, with rows of small teeth covering the palate. The jaws themselves, however, have only one row of teeth, all very pointed. To my intense annoyance, my eel specimens were lost with the silurides. 136 ●

(On rare occasions the Onges manage to catch the toad fish of the mangrove swamps. These curious little animals are apparently a compromise between the fish and the frog; they can breathe both in the air and under water and like to come out of the water to take a walk. They wriggle about in the pools left by the ebb tide, popping out into the air as soon as they meet anything suspicious, and hopping away over quite considerable distances. But normally they wander peacefully about on the mud, propelling themselves with their two pectoral fins, which are attached to the end of a form of arm. In size (never over twenty centimetres long) and colour they remind one of the gudgeon, to which they are related. They belong to the genus *Periophthalmus*, of the order Gobiidi. They seem to prefer living in the open rather than in the water, and appear to look forward to low tide, when the tiny creatures on which they feed are about. Hunger satisfied, they cling to some stone or tree-trunk, often in an almost vertical position, and will stay there over half an hour, particularly if their tail is touching the water, as this keeps their body damp and helps them to breathe by means of ingenious gill sacs filled with air. [226]

Toad fish move into the marshes as the sea recedes and move back as the tide returns. In the middle of the day they seek the shade in the damp crevices of the mangrove swamps. They seem to glory in the first rays of the morning sun, their huge erectile eyes, which never rest, moving endlessly from side to side. Their independent movement enables the creature to gaze at the sun with one eye and look for likely prey with the other. The two eyes, set closely together on top of their flat heads make them look rather ridiculous. Another striking feature about them is a kind of sucker, or adhesive disc, formed by the ventral thoracic fins. These have a loose fold of skin on the back, so that when the fins are brought together in front of the body, the skin falls into a funnel shape, which when pressed against a stone or tree-trunk adheres to it by suction, holding the animal fast.

I was amused by the way toad fish can be domesticated as soon as they are caught. I kept some in my tent, leaving water available [126]

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136 for them and feeding them on the table. As soon as they saw worms
126 wriggling, they would move cautiously towards them and then snap them up like lightning. They became used to sitting in my hand quite undisturbed, looking round in two directions at once in an interested way. Flies held by the wings fascinated them more than anything, and they used to stare at the insects as though hoping to mesmerize them. They made delightful pets.

136 More prosaically, they are very good fried. Outside Little Andaman I found hundreds every day near Golpahar on Middle Andaman, and as the fish market in Port Blair was over a day's journey away we used many for non-scientific purposes.

136 Dugong, monitors, snakes, jungle cats, bats, leeches - all abound in Little Andaman and I had ample opportunities to study them. The dugong are well known to the Onges, but I only saw them at Bumila Creek (Cuateniabo) and Jackson Creek, where I did not have the time to catch any; the Onges tried, but without result.

Dugong (from the Malayan *Dyong*, introduced into scientific Latin as the family *Dugongidae*), are large mammals of the order *Sirenia*. They have a short fish-like body, with closeable nostrils above a cavernous mouth, which is surrounded by short bristly whiskers and armed with a brush-like, horny plate. In the male two short tusks hang down each side of the mouth, like a miniature hippopotamus, giving the animals a cumbersome, ugly look. The [225] Onges prize the dugong, but rarely manage to capture one; when they do, there is great feasting. I was never able to try it, or even acquire any really close observations of the creatures.

136 Monitors or dragon-lizards, on the other hand were under my feet every day, although the islanders never eat them. I used to put
126 out as bait fish or pig carcasses rejected by the Onges as being too
[262] lean, and we could then shoot as many as we wanted as they rushed to the bait from all sides. I collected their skins for various museums, using the carcasses as further bait.

136 The Andamanese variety is well known and it closely resembles *Varanus niloticus*, the Nile monitor, to which it is related. The largest can be two metres long, including the long, very tapering tail. As they approach their prey, sniffing at it, their forked tongue, twice the length of the head, flashes in and out of its sheath with incredible speed. Although they have strong legs they move slowly and it is easy to catch them by the tail, providing one takes care to

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avoid being bitten, and one blow on the spine kills them. Compared with the turtle, for example, their vitality is poor, and they die very quickly, although strangely enough the heart beats for some hours after death.¹ 136 ●

These carnivorous lizards are the jackals of the Andamans, scavengers ready to eat anything, from offal even the dogs will not eat to the rotting carcasses of the dogs themselves, and even of their own kind. In the forests of the Andamans death is swift and silent, and the monitors ensure that it leaves no trace.

¹ On a number of occasions I took out the respiratory and digestive system, with the heart, and both systole and diastole and peristalsis continued regularly for some hours.